EXPERT ADVICE • TOP TIPS • BEST BUYS • MORE FACTS

NEW AMIGA? MASTER IT WITH US

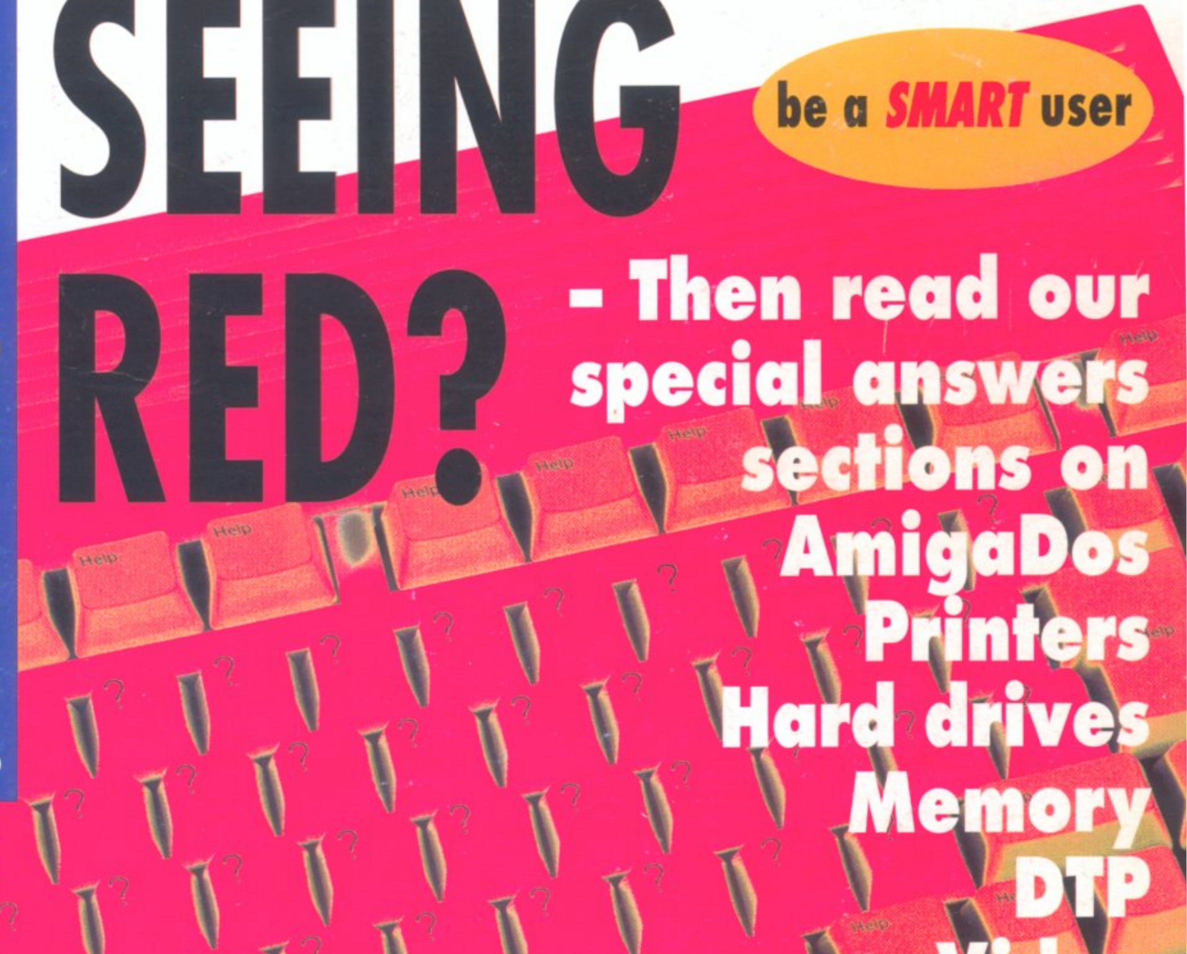
AMIGA SHOPPER

From the makers of Amiga Format

ISSUE 18 • OCTOBER 1992 • £1.50 • YOUR DEFINITIVE GUIDE

SEEING RED?

be a *SMART* user



- Then read our special answers sections on AmigaDos Printers Hard drives Memory DTP Video & Programming

Your 32 page trouble-shooting guide begins on p15

PUBLIC DOMAIN WORLD

All the very latest low-cost and no-cost software reviewed

SCOOP!

The A600's price is slashed! - and what's the A2200?

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mini Office

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FIVE MODULES FOR JUST £59.99!



- A professional **WORDPROCESSOR** with powerful graphics capabilities and a 50,000 word spell checker. Ideal for a wide variety of correspondence and official documents.
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Wordprocessor: Compose a letter, check your spelling with the 50,000 word dictionary, mailmerge details from a database file, add graphics, wrap text around it, load ASCII text, highlight with bold, italic and underline... and more!



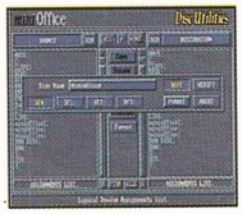
Database: Build up a versatile card index, incorporate up to 50 fields with 70 characters each, use search and replace to modify data, do powerful multi-field sorting, perform arithmetic functions... and more!



Spreadsheet: Prepare budgets or tables, alter column widths, insert or delete columns, cut and paste data, lock blocks, choose from over 50 functions... and more!



Graphics: Enter data directly or load from the spreadsheet or database; produce pie charts with exploded segments; display bar charts side by side or stacked; overlay your graphs on an imported IFF picture; add a 3D view; add text or lines... and more!



Disc Utilities: Avoid the confusion of Workbench, create bootable files, format discs, copy files from disc to disc; make directories; delete and rename files, make multiple copies of your discs... and more!

RELEASED SEPTEMBER

europress SOFTWARE

Europa House, Adlington Park, Macclesfield, Cheshire SK10 4NP, Tel: 0625 859333

Mini Office works on all Amigas with 1 megabyte RAM, can read Amiga IFF files and for US users, fully supports the NTSC standard.

AMIGA SHOPPER AT A GLANCE GUIDE

To help you find what you want quickly and easily, this is a cross-referenced list of all the products and subjects covered in this month's *Amiga Shopper*. The subjects covered in Amiga Answers are detailed on page 15; the many PD programs covered on page 128 are listed there. The page numbers given are for the first page of the article in which the product is mentioned.

Are there any products or subjects you'd like us to take a look at? Well, just drop a line to:

Amiga Shopper,
30, Monmouth Street,
Bath BA1 2BW.

WELCOME

This month we've changed the look of our *Amiga Answers* section somewhat with an attempt to gather up all the commonly encountered problems into a series of flow-charts. Such is the complexity of the Amiga and the systems designed to run with it, that we would probably need a whole issue to fully chart all the possible problems and solutions. So we've done the best we could given the space available and hope you find them specific enough to be useful. Next month it's back to the normal format so keep sending in those niggles and nightmares!

Otherwise, what else do we have for you this month? Well, two new series kick off for a start. First up is a set of practical articles on chaos and fractal theory – not too heavily mathematical of course, but informative enough for you to experiment yourself and have some idea what's going on. Not too dissimilar is the new series on computer life which stems from our earlier features on artificial intelligence and neural networks. Again, the pieces are practically based; leading you to colonising a portion of your Amiga's memory with self-reproducing life-forms!



Next month we have three more new series starting too – one on multitasking, one on C and one on ARexx – so stick around.

But back to this month and the two main stories. A price-cut for the A600 – no real surprise there, I suppose – and Commodore announcing a 68020-based Amiga for less than a £1000. There'll be those who say CBM should've gone for a 030 or 040 but I'm not one of them.

An 020 Amiga is fine. To borrow Atari's slogan it offers 'power without the price'. And isn't that what we're all after?

Enjoy the ish!

Andy Storer

Editor

PUBLIC DOMAIN WORLD

POWER TEXT

There are thousands of Amiga programs which are available for little more than the price of a disk. And many more which allow you to try the software free before you buy. Each month in Public Domain World we examine the best of these programs and explain how to get hold of them.

This month we focus on a new PD word processor, a desktop harpsichord, a fractal landscape generator and a great set of CLI utilities.

Public Domain World or

This is almost the free world

as we call it this month, start on page 128

AMIGA ANSWERS

32-PAGE SPECIAL EDITION

This month in Amiga Answers our panel of experts have set out to provide an overview of the common problems you're likely to encounter when using your Amiga. There's sections on DTP and word processing, printers, video, AmigaDOS, programming, memory, hard drives and a handy beginners' area. So if it's answers you're after turn to page 15 and start to go with the flow!

FOR A FULL LIST OF CONTENTS, TURN THE PAGE

Your guarantee of value

This magazine comes from Future Publishing, a company founded just seven years ago, but which now sells more computer magazines than any other publisher in Britain. We offer:

Better advice. Our titles are packed with tips, suggestions and explanatory features, written by the best in the business.

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- Satisfy them.

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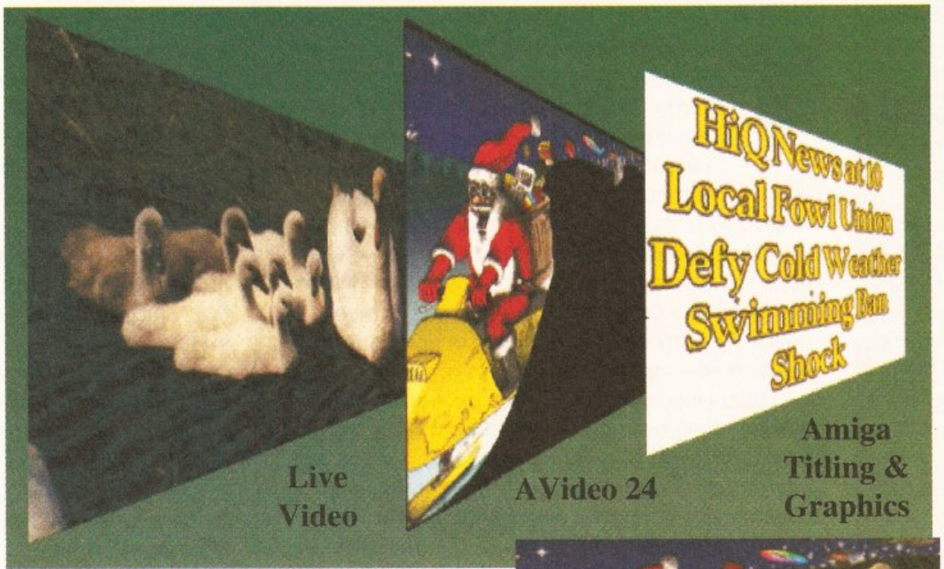
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The home of Britain's finest computer magazines:
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Mountain Biking UK • Needlecraft • Classic CD • Cycling Plus • Photo Plus • Total!
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AVIDEO 24 + Animation

16.8 Million Colour Display Card for all Amigas.



Compatible Software

TVPaint version 1.7

This amazing software package allows painting in 24 bit in real time. It has already become the standard paint package for the professional. It needs 68030 or above and 8Mb of Ram. Short cut keys follow the DPaint style. Don't miss out on this wonderful package.

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.....and finally a worlds first. All three Video planes on the same screen and on the same computer!



AVIDEO Specifications.

768 x 580 Broadcast Displ

24 bit, 16.8 million colour

Double buffered 12 bit, (4096 colours) animation with upto 25 fps in non-la and upto 12.5 fps in interlace.

Small easy to fit board, works with all Amigas except A1000.

Fully Genlockable with adaptor cable £39.00

Comes with 24 bit paint package, Multi-Media software and Animation utilities.

Allows PIP with Workbe Version 2.0

Only £ 369.00

Amiga 600 Fast RAM Card

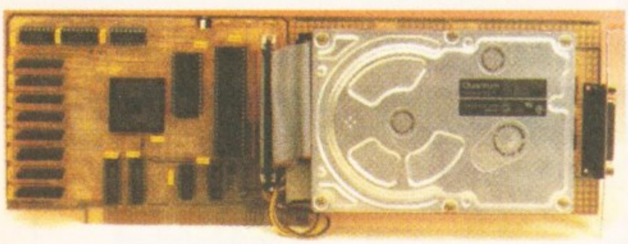
AMEM 600 is a Dynamic RAM expansion board for the Amiga 600 that plugs into the new PCMCIA external port on the side of the unit.
AMEM 600 is a credit card size unit (5x8cm) and only 5mm thick, which comes in two models: 2Mb and 4Mb.
AMEM 600 adds 2Mb or 4Mb blocks of contigous FAST RAM addressable directly by the 68000 chip. Applications in FAST RAM run upto 20% faster than those in CHIP RAM. The internal bus connector of the 600 only allows 1Mb of Chip Ram, therefore the external PCMCIA connector is the only viable memory expansion socket.
AMEM 600 is the only PCMCIA Dynamic Ram card available on the market. Static memory cards turn out to be 4 times more expensive than AMEM 600 for the same capacity.
AMEM 600 includes its own PCMCIA controller and does not steal any undue cycles from the 68000 processor. It Auto-Configures at boot time so that the entire system is located in FAST RAM leaving most of the internal Chip Ram free for Image Processing.

AMEM 600 - 2Mb £ 129.00
AMEM 600 - 4Mb £ 169.00

Dealers please contact Telesales at:- SDL

Also known as AMITEK.

ADD-2000 SCSI/RAM System for the Amiga 2000/1500



The same low cost, high performance system as the ADD-500, but in a Hard Card format. Ideally suited for the Video and Multi-Media enviroments where low cost and high performance is a priority.

ADD-500

SCSI Hard Drive and Ram System.



Using low power CMOS technology, the ADD-500 gives the Amiga 500 owner the ideal low cost, high performance drive system. With 770Kb/sec transfer speed (test DiskSpeed) this system is also one of the fastest on the market.

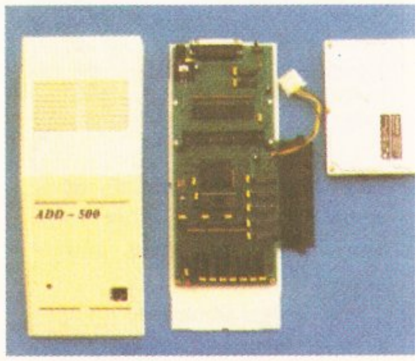
Ram can be expanded upto 4megs in 2mb increments using low cost ZIP chips.

The ADD-500 case is made from strong plastic, and made to compliment the Amiga 500, with good ventilation and low heat generating components this is a very cool product.

The ADD-500 supports Autobooting from Kickstart 1.3 upwards, Amiga FFS system partitions, and full AutoConfigure support. The ADD-500 supports MSDos and Macintosh partitions with the suitable emulators.

Full SCSI system support with upto 7 drive on the SCSI chain. With the 25 way SCSI connector on the rear will allow external connection of extra devices.

The ADD-500 does not cause any conflictions with any Amiga hardware, including Genlocks, Flicker Fixers and Super Hires Mode etc.



ARCHOS

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INSIDE THIS ISSUE

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So how about winning another year's free subscription then chaps? - this time it's all about East Enders (since some sod reckons I look like Dirty Den). Okay, answer this - what was the name of the wine-bar Den torched? You got it? Then just send the name to: 'Wilmott-Brown deserved it, the dirty cad', Amiga Shopper, 30, Monmouth St, Bath, BA1 2BW. First out the bag wins 12 free issues . Oh, and last ish's winner was Jonathan McBrien - well done Jonathan, Roland's furry friends were indeed Kevin, Errol and Reggie!

Two new Amigas announced
A600 price drop – A570 released

This time it's official: Commodore has announced its latest Amiga.

The machine is an A3000 in a tower case, with a 68040 processor running at 25MHz. Although not the A4000 we had hoped for, it is nevertheless the most powerful Amiga so far, with a speed of around 32 million instructions per second.

Called the A3000T-040/200, the machine comes as standard with a 200Mb hard disk, 1Mb of Chip RAM and 4Mb of Fast RAM. It will be available from mid-September in America for a price of $5,998. A UK price has yet to be set, but expect to see the model in this country towards the end of September.

Commodore is also expected to announce a brand-new mid-range Amiga before Christmas to replace the A2000. Commodore UK's managing director Kelly Sumner told Amiga Shopper that the new machine will be called either the A2200 or the A2400. The first of a new set of machines, it will be based on a 68020 processor and will sell for under £1,000.

GRAPHIC IMPROVEMENT

The A2200 will be better than the 68020-based machine released in the States two years ago, said Sumner. It is expected to be the first to include the latest graphics chips (known as the 'AA' chip set) which should put Amiga graphics ahead once more.

Compatibility with its predecessors is a difficult area but, unlike Atari with its ST-E, Sumner said that he hoped there would be no compatibility problems between the A2200 and the earlier machines. *Amiga Shopper* has learnt that Commodore has been talking with developers to ensure that they write software that will work with the new chip set.

Commodore has been far from idle this month. Along with the new A3000 comes a radical price drop for the A600. After little more than three months since its launch, the machine's price has dropped from £399 to £299. The hard disk model remains at £499, allegedly because of the cost of the hard disks themselves. Currently A600s and A600 HDs are selling in the ratio of 60/40, with total sales of 60,000 between mid April and the beginning of August. No doubt the price drop will alter this ratio considerably.



It seems that for once Commodore's manouverings have met with approval from all quarters (aside from those who have just bought an A600 at the old price).

CD-ROM BOOST

Another piece of good news is that the A570 CD-ROM drive has finally been released for £349.99. As with the prototype (previewed in issue 12), the unit plugs into the A500 or A500 Plus's side slot and gives access to CDTV software. Bundled with it is the CDPD disc, containing the complete Fred Fish public domain collection up to floppy disk number 660, and the CDTV Welcome disc.

Unfortunatey the A570 is only compatible with the A500 Plus or an A500 fitted with the fat Agnus and 1Mb of Chip RAM. As a consolation to owners of other Amigas Commodore suggests that they should take advantage of its trade-in scheme to get a CDTV with keyboard, floppy drive and mouse for £399.99.

An independent survey commissioned by Commodore estimated that 480,000 A570s will be sold within the next two years, and Commodore expects to sell around 33,000 by next spring.

The new drive should encourage developers to use the CD format. At the moment CDTV's user-base is just 18,000, but the A570 will help swell the market, so developers can expect to make a decent profit. And this increase in CD sofware should help to increase sales of CDTVs. It seems the CD bandwagon is about to start rolling with a vengeance.

What do the dealers think?

So how much of a smart move is the A600 price-cut? Here's what a selection of Commodore dealers reckon:

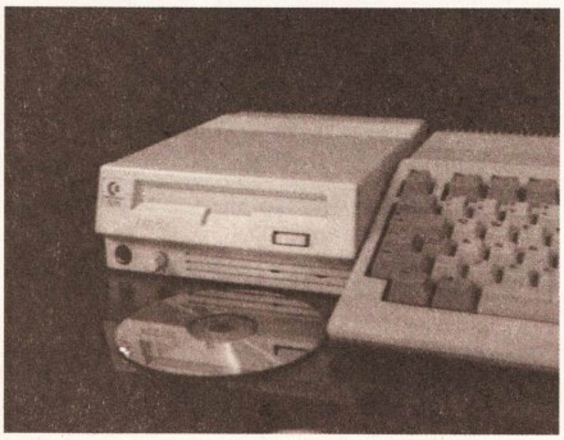
"I guess that it is now at the price it should have been when it was launched." Richard Austin, Evesham Micros

"We welcome this price cut, which keeps the Amiga competitive." Giles Harwood, Gordon Harwood Computers

"It's a good move from the point of view of the prospective customer. " Gary Anderson, Merlin

"It's a good idea; it's certainly going to increase sales." Bryan Ramshaw, Marcliff Computers

"£299 is a big psychological mark. The price reduction had to be done to shift a lot of stock at Christmas." Jonathon Sherlaw, Diamond



Top: the A600 which has dropped from £399 to £299 within three months of its launch. Above: the A570, released at £349.99, gives access to CDTV software

Accelerators too hot to handle

A fire has swept through Progressive Peripherals & Software's factory in Denver.

Immediately after the event rumours were circulating that the fire occurred in suspicious circumstances, but it has since been ascertained that the fire began in a motor body repair shop sharing the same industrial complex as Progressive's factory.

After several hours the fire department managed to bring the blaze under control, but by then the complex had been razed to the ground.

As a consequence Progressive Peripherals lost all of its stock and manufacturing capability. The company has made a swift recovery, and by the time you read this it should be shipping products at a normal rate, which means that you can expect a review of its remarkable 68040 accelerator for the A500 in the very near future.

The company's telephone number has changed to ☎ 0101 303 238 5555. Its products are to be sold in the UK by several companies, including Accelerators Unlimited ☎ 0253 795796.

Fred's fish on squished disk

The entire Fred Fish public domain library has been placed on a single compact disc by Almathera Systems.

Entitled CDPD, the disc includes every program appearing in the Fred Fish collection up to and including disk number 660. The cost of buying all of these programs separately would be in excess of £1000.

As well as containing many useful programs such as text editors, spreadsheets, a database and a sound tracker, the collection is an invaluable educational tool, illustrating many Amiga concepts with which users may be unfamiliar and including source code of use to programmers for many of the utilities supplied.

The disc costs £19.95, with regular updates being made available to registered users at 'inexpensive' prices. It is suitable for use with Commodore's CDTV; it can also be used with an Amiga and the A570 CD-ROM drive, which is now on sale (see lead story, left) and with which CDPD is to be given away free.

Almathera Systems ☎ 081 6836418.

Professional Draw update

American developer Gold Disk has released version 3 of structured drawing program *Professional Draw*.

Structured drawings differ from ordinary bit-mapped pictures in that they can be scaled without loss of resolution or the introduction of jagged edges.

Version three offers a number of enhancements over earlier versions. It utilisies the concepts of Genies, enabling complex operations to be performed with a couple of mouse clocks, and Hot links, which enable the transparent exchange of information between *Professional Draw* and programs such as *Professional Page*.

Further enhancements include: radial and gradient fills, text editing directly on the page, Adobe Type 1 and Compugraphic font support, objects displayed in full colour or as wireframes, undo and redo functions, Pantone colour system, improved colour separation, improved autotrace to convert bitmaps to structured drawing format, free clip art, importation of 24-bit IFFs and auto-tiling, enabling pages to be accurately split across several sheets of paper.

Professional Draw 3 costs £129.99 from HB Marketing ☎ 0753 686000. People with earlier versions will be able to upgrade, but a price for this has yet to be announced.

Gold Disk ☎ 0101 416 6024000.

Mighty mouse

Probably the most expensive mouse in the world is being sold by American firm Selectech.

The AirMouse operates via infra-red, without the need of a flat surface. A user giving a presentation need only point it towards a projected screen and click a button to make a selection as with an ordinary mouse. The unit's infra-red signals are picked up by a small base unit which feeds information to the computer via a serial link. Drivers are available for many computers, including the Amiga and CDTV.

The AirMouse costs $595, so if you have a need for a mouse almost as expensive of your computer then give Selectech a ring on ☎ 0101 802 655 9600.

CORRECTION

In last month's issue we printed the wrong telephone number for Hands On MIDI Software. The correct number is 0705 221162

The future of entertainment

The Future Entertainment Show is set to be the biggest and best computer show for five years.

The show is to incorporate the World Of Commodore Show, that runaway success which so many of you visited last November. This time attendance is expected to be in excess of 100,000 people.

It will take place at both Earls Court 1 and 2, from November 5 to November 8. Opening times are 9.30am – 5pm (Thursday till Saturday), and 9.30 – 4pm (Sunday).

There will be a hell of a lot to do, buy and see. All of the big names in Amiga hardware and software will be there, including Commodore itself, Progressive Peripherals & Software, WTS, Power Computing, Citizen, Datel, Rombo, Futureworld, Ashcom, Cortex, Digita, Electronic Arts, Pandaal and Silica. There'll be the Christmas shopping mall where you'll be able to pick up some stunning bargains, some fairground rides to help you digest the readily available fast food; and the *Amiga Shopper* team will be there to talk about the magazine and give technical advice.

If games are more your bag, then you won't be disappointed. This year Amigas will be rubbing shoulders with Nintendos, Segas, PCs and STs. There'll be two video game arcades and loads of competition prizes. What's more, this could be your chance to get on TV. Future Publishing is organising the National Computer Games Championship in association with *Bad Influence!*, the new Yorkshire TV computer programme. So get your face on the box and win up to £10,000!

No matter what your interest in computers, the Future Entertainment Show will be the place to be. Book your ticket now on the credit card hotline ☎ 051 356 5085. Be there or be the product of two orthogonal lines of equal length.



The World of Commodore show is all set to become part of the Future

Cheaper T-shirt prints

Studio 101 has reduced the price of its T-shirt printing service.

The reductions come as a consequence of Studio 101, which has recently celebrated its first birthday, negotiating a better deal with its suppliers. The benefits of this deal have been passed on to its customers, enabling the company to offer cotton T-shirts at £10.99 in medium, large and extra large sizes. The T-shirts can be printed with user supplied artwork in IFF (including 24-bit) or HAM format.

In addition, the company can produce full colour A4 and A3 prints of users images. The costs are as follows: A4 plain paper £2.99, A4 glossy paper £4.99, A4 overhead projector transparency £4.50, and A3 plain paper £5.50. Studio 101 ☎ 0827 280884.



A better deal for T-shirt fanciers

Get a Star printer driver – free!

Free Amiga printer drivers are now available for the entire Star range of printers.

Continuing the enlightened trend set by other printer manufacturers, Star is now giving away a driver with every printer sold, saving the buyer the hassle of trying to track one down via the public domain. Every Star registered dealer now has a set of the Star drivers. Anyone still experiencing difficulties in obtaining the correct driver can call Star's Technical Hotline ☎ 0494 471111.

Kind words from the makers of Wordworth

The Disc Company has released the latest version of *KindWords*.

KindWords 3 follows in the footsteps of its predecessors, but with one big difference: it has been written by UK firm Digita. Digita is responsible for the highly acclaimed *Wordworth* word processing package, and has included that program's intuitive Human Interface Protocol in its version of *KindWords*. This should mean that *KindWords* is easier to use than previously, and also that new users of *KindWords* will find *Wordworth* a breeze to operate too.

Digita is hoping that many *KindWords* users will upgrade to *Wordworth*, and has implemented a trade-in scheme. Owners of *KindWords* can send the front page of their manual (plus £49.99) and receive a copy of *Wordworth* in return. *Wordworth* normally retails for £130.

Features of *KindWords 3* include: spelling checker and thesaurus, on-line help, flowing of text around pictures, automatic hyphenation and automatic page numbering. It is available from, among others, HB Marketing ☎ 0753 686000. Digita is on ☎ 0395 270273. The Disc Company is on ☎ 01033 49109995.

Wordworth

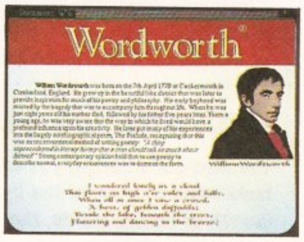
a writer's dream

ON DEMONSTRATION AT The Future Entertainment Show

v1·1

The graphical nature of Wordworth® makes producing documents faster and easier. The WYSIWYG display shows exactly how your printed document will look, different fonts, styles and sizes, headers and footers, graphics and so on.

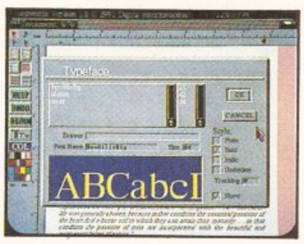
Commands are grouped under a series of pull-down menus, accessible either by the mouse or keyboard. Frequently used commands have on-screen icons, including Help, should you need it.



Experience the look and feel of the new and exciting WB2 (even if you use WB1.3). Each document is a separate multi-tasking window, which means you could for example, print one document while editing another.

Digita's® innovative *Human Interface Protocol*™ is incorporated setting a new standard in speed, style and elegance. "It *HIP*™ system is intuitive and a pleasure to use." – thank you Amiga Shopper, it's nice to be appreciated.

Graphics have always been the Amiga's strong point. Now it's better than ever. Pictures from Deluxe Paint can be placed in a document, and then sized, scaled and dragged (text automatically reformats around the image).

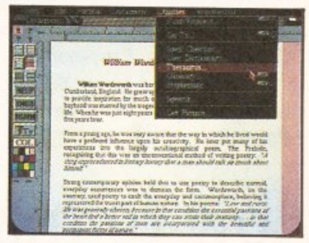


Wordworth's enhanced fonts will give you the very best printed quality. You can also print special symbols, such as boxes, arrows and so on. Better still, you can mix graphics, Wordworth's enhanced fonts, Amiga fonts, Colorfonts and your printer's own internal fonts, all on the same page. There's even a driver for Postscript printers.

You needn't worry about your existing information – Wordworth will let you open documents from most word processors, including Kindwords, Protext and Wordperfect (you can also mailmerge with Superbase).

When Amiga Format said "a new word processor that will give the rest of the world a run for its money" they weren't joking.

Wordworth is written in the UK by Digita. Which means you'll be using an English Collins spelling checker and thesaurus, and you'll know where to come for professional support.



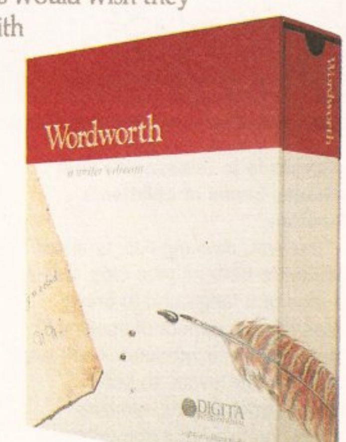
The only way to really appreciate Wordworth is to use it. Phone 0395 270273 for more information or, write to Digita, FREEPOST, Exmouth EX8 2YZ.

Wordworth costs £129.99, which includes VAT, postage and packing; and when purchased from Digita, comes with a 7 day money-back guarantee.

If you already own a word processor, for a limited period only, you can trade-up for just £89.99 by returning your original disks to Digita with your order.

Summing up, Amiga Shopper said: "Pounds-per-feature no other Amiga word processor comes close. Wordworth is what every owner of Kindwords would wish they had." Dreams become reality with Wordworth.

Machine support
Written specifically for the Amiga
Fully supports WB V1.3 and V2.00
All medium or high resolution modes
(mono and colour)
Requires 1MB of memory



DIGITA® INTERNATIONAL

software thats right™

Wordworth is available from John Menzies, Virgin, W H Smith and all good computer retailers or to the trade through Columbus, Gem, HB Marketing, IBD, Lazer, Leisuresoft, Precision and SDL.

Digita International Ltd Black Horse House Exmouth EX8 1JL ENGLAND Tel 0395 270273 Fax 0395 268893

– A member of the Digita group –

Amigas to be installed in nuclear power stations

Eight Amiga CDTVs are to be installed in commercial nuclear power stations throughout England and Wales.

The machines which, some claim, have the most reliable operating system in existence, are to take their places inside fully functioning atomic plants as part of a plan to reassure the public.

Nicolas Mullane, Publicity Services Officer of Nuclear Electric, stated: "We decided to take CDTV for its reliability and cost."

The machines will be stationed in visitior centres and in viewing galleries that overlook the pile caps of the reactors.

Surprisingly, they will be taking no part in the control of the reactors themselves, but will rather be acting as multimedia terminals divulging information about the theory and practice of nuclear energy to curious visitors.

The software used was developed in 12 months by Distance Learning Systems, as part of a system which is to replace the traditional slides and projectors which Nuclear Electric's guides use at the moment and which are "prone to break down or become jammed". This, of course, in no way reflects the quality of the components used in the reactors themselves.

Initially the new machines are to be placed in three nuclear plants: Wylfa in Anglesey, Trawsfynydd in North Wales, and Heysham in Lancashire. They are to be presented to the remaining nine power stations in the future.

The twelve sites between them received 155,000 visitors last year. This year the figures is expected to be 250,000, so CDTV should be getting plenty of exposure.

The many faces of type

Amiga desktop publishers will be pleased to learn that FontShop has released a large collection of scaleable fonts.

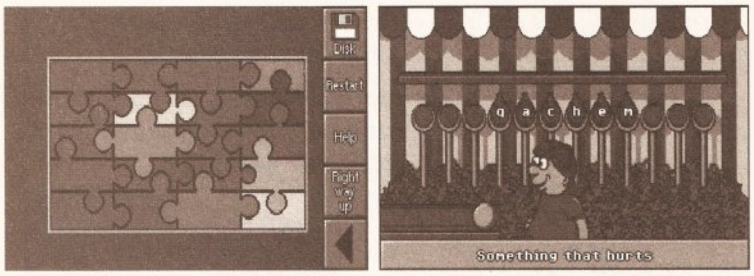
The company has compiled 350 Adobe Type 1 fonts for use with *PageStream* and *Professional Page* version 3. They are available in seven volumes of 50 fonts each, at a cost of £10 per volume. Instructions are provided, along with font support utilities and pictorial previews.

The company has also released three volumes of Compugraphic fonts costing £12 each, again with 50 fonts per volume. These fonts are suitable for use with *PageSetter 2*, Workbench 2.0x and *Professional Page 2* or greater.

With the fonts already available from George Thompson Services and EM Compugraphics, FontShop's additions mean that Amiga desktop publishing has never been better.

FontShop ☎ 0526 398403.

How to make learning much more fun



***Paint And Create* and *Spelling Fair* promise to put some laughs into learning**

Europress is to release two new packages aimed at children's education.

The first, *Spelling Fair,* is aimed at seven to thirteen year olds. Using the idea of a fairground to bring across the fun aspect of spelling, it is made up of six modules, each with three difficulty levels, to teach children about plurals, similies, suffixes, prefixes and homophones.

In *Test Your Strength* the child uses a hammer to bash a gong and learn about unusual plural formations. A *Mechanical Grabber* section is used to illustrate the concepts of suffixes and prefixes, while homophones are dealt with by the *Haunted House* program. Also included are *Word Juggle* – making up words from a 3,000 word dictionary – and *Circus Words* where you complete crosswords.

Spelling Fair will sell for £25.99.

The second release from Europress is *Paint And Create*, a package designed to encourage creativity in children aged five and over.

The successful techniques of the company's earlier *Fun School* releases are employed to make learning fun with the inclusion of games and bright, bold colour displays.

Access to *Paint And Create*'s various sections is gained via an animated menu system with the appearance of a scrolling landscape. A drawing program forms the main section of the package. Also included are a jigsaw section, a monster making section and a music program complete with teddy musicians.

Paint And Create will sell for £25.99, and should be available by the time you read this.

Europress ☎ 0625 859333.

Music magazine emerges

The musical amongst you will be fascinated to learn of the imminent launch of *Future Music*, the music technology magazine.

Coming from Future Publishing, the same stable that produces our own illustrious tome, the magazine will deal with all aspects of modern technology in the music world: computers (including the Amiga), software, synths and so on. The title will be edited by Bob Wade who, as many of you no doubt remember, was the first editor of Amiga Shopper.

The first issue of *Future Music* goes on sale 15 October for £1.95.

From Germany with chips

A German-based distributor is offering Amiga chips to dealers at attractively low prices.

The price of Amiga products in Germany have long been the envy of Amiga users. Now Grenville Trading International is to sell parts to UK dealers, we may soon see an equalisation of prices.

GTI supplies a number of Amiga chips, RAM expansions and assorted peripherals. As a guide: a 2Mb Agnus chip sells for £23.62, but such prices don't include VAT or postage, and are only for computer dealers.

GTI ☎ 01049 617185936.

A300 PRICE DROP

Commodore has announced heavy price cuts for the A3000 range.

The A3000-25/50 (with 2Mb of RAM and a 50Mb hard disk) has gone down from £2,999 to £1,299. The A3000-25/100 (with a 100Mb hard drive) goes from £3,299 to £1,499, while the A3000T-25/100 (with 5Mb of RAM) has been reduced to only £2,044 and the A3000T-25/200 (with a 200Mb hard drive) will now set you back a mere £2,540.

DATES FOR YOUR DIARY... DATES FOR YOUR DIARY... DATES FOR YOUR DIARY...

September 5: All Formats Computer Fair. National Motorcycle Museum, Solihull. ☎ 0225 868100.

September 12: All Formats Computer Fair. Sandown Racecourse, Esher. ☎ 0225 868100.

September 19: All Formats Computer Fair. Donington Racecourse, East Midlands. ☎ 0225 868100.

October 3: All Formats Computer Fair. Northumbria Centre, Washington. ☎ 0225 868100.

October 4: All Formats Computer Fair. University Sports Centre, Leeds. ☎ 0225 868100.

October 10: All Formats Computer Fair. City Hall, Glasgow. ☎ 0225 868100.

October 11: All Formats Computer Fair. Assembly Rooms, Edinburgh. ☎ 0225 868100.

October 17: All Formats Computer Fair. Novotel, Hammersmith. ☎ 0225 868100.

October 18: All Formats Computer Fair. Brunel Centre, Bristol. ☎ 0225 868100.

October 24: All Formats Computer Fair. Haydock Park Racecourse. ☎ 0225 868100.

November 5-8: The Future Entertainment Show. Earls Court 1 and 2, London. ☎ 051 356 5085.

EXPAND YOUR AMIGA

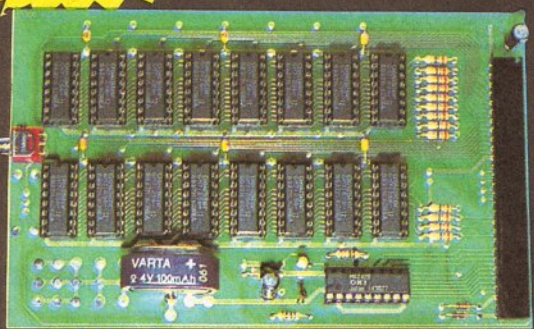
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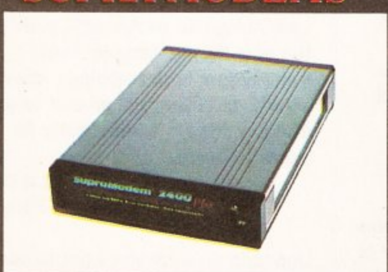
£16.00 without clock **£19.00** with clock

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- ★ **KICKSTART 1.3** £28 £36 • Allows existing A500 Plus owners to run old software when used in conjunction with switchboard
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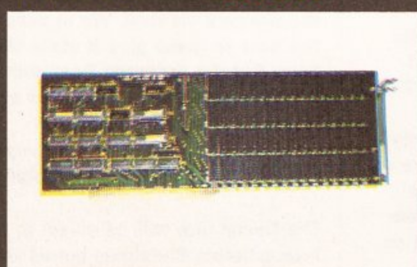


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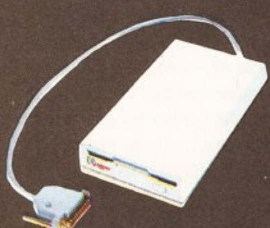
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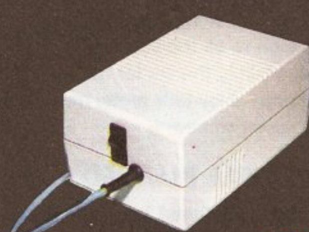


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Tel: 0582 491949

Talking SHOP

Welcome to the Amiga world's liveliest letters pages! – the place where you get the chance to speak your mind. So join your host, the editor, Andy Storer for some more no-holds barred bantering. And remember, all you have to do to be included is send your missive to: 'Talking Shop', *Amiga Shopper*, 30, Monmouth St, Bath BA1 2BW. So get to it!...

FALCONS OVERHEAD

I'm just writing to fill you in on some of the rumours which are circulating. Did you know that Atari is releasing its Falcon next month and it will be over here at Christmas. The rumoured specs are: full ST compatibility, 32-bit architecture, DSP 56001 processor, 16-bit 8 channel sound, 262,000 colour palette with 32,000 on screen, cost £400.

The rumoured Amiga 2200 specs are: 32-bit architecture, 68020 14.3MHz, a socket for the 68881 FPU, 1Mb Fast RAM and 1Mb Chip RAM, expandable to 2Mb Chip and 8Mb Fast RAM, de-interlacer, one high density floppy (1.76Mb) and a 52Mb hard drive or two HD floppies; graphics specs vary from rumour to rumour – from 65,535 colour palette with 256 on screen to HAM-E spec, 24-bit palette with 262,000 colours on screen (we hope). Cost £?

There will be a new flagship range, the Amiga Station. The first, the Amiga 4100, will come with 25MHz 68040, 4Mb Fast RAM, 2Mb Chip RAM, up to 32Mb RAM, de-interlacer, SCSI-2, 105Mb hard drive, high density floppy, dual 8-bit audio up to 44KHz, 16-bit audio up to 22KHz through one channel.

The Amiga 4200 specs are the same as the 4100's except for: 8Mb Fast RAM and 2Mb Chip, 210Mb hard drive, hi-res co-processor based video card with 1280 x 1024 resolution and 8-bit colour from a 24-bit palette, expandable to full 24-bit.

The Amiga 4300 specs are the same as the 4200's except for: a Tower case, 330Mb hard disk, five 32-bit expansion slots, up to four 3.5" HD floppies and two 5.25" floppies fitted internally.

What worries me is that the Atari Falcon spec appears to be better than that of the Amiga A2200, especially in the sound department. I will be sickened owning a machine which comes second best to a machine built by the Amiga's old rival. We're used to the best so make sure it stays the best. Get the message Commodore.

Superb magazine. Give us more news. Long live the A500.

A Campbell
Pontefract

The Falcon may well be all set to swoop before Christmas but as far as I'm concerned it's already too little too late for Atari. Who's going to develop for it these days when all the main software houses pulled out of the ST market well over a year ago? I shouldn't worry – just leave the Falcon to all the dreamers. Meanwhile thanks for the machine specs – they tally pretty much with what we've heard.

DOUBLE BLUFFED

Congratulations! You were taken in!

Your item 'Hot New Amigas' on page 12 of *Amiga Shopper* (September 1992) was based on a USENET wind-up. The original posting ended with the words "It was just a dream, guys". Somewhere along the line, these words got cut and the rumour spread. Admittedly, it all sounds fairly plausible with references to new chip sets and Kickstart releases, but it is mere speculation.

I think you should check your sources a bit more carefully before publishing!

Dr Andrew CR Martin
Ashtead

We stated categorically that we could not verify the story in the first paragraph – what more can we do? – print 'don't believe any of the following', or headline it with 'Two new completely fictitious Amigas announced...'? I agree it did sound plausible, that's why we ran it with the qualifier.

BARGAIN HARD DRIVES

In *Amiga Shopper* last month, you could get a 2Mb A500 Plus with A590 20Mb hard drive for £600, yet a 2Mb A600 with 20M hard-drive could be bought for only £490. Basically, if you want a decent system with enough memory and hard drive capacity to support a single major application, such as word processing, you'd be better to save over £100 by going for the A600. In other words, you're getting a 20Mb hard drive for only £140 – the cheapest I've ever seen; and an official model at that!

Further, your magazine seems to have overlooked the fact that the majority of users don't need to upgrade their machine beyond recognition with 24-bit colour, 5Mb memory, massive hard-drives etc, etc.

OK, these would be nice; but most people only use a couple of programs intensively – for word-processing for example – and so a 20Mb hard drive is perfectly adequate. You may lose a numeric keypad by going for the A600, and the A600 is certainly less expandable, but it's true to say most people won't miss these features.

In return, you get such a cheap hard-drive (I'd like to see a review of the drive) and full support now and in the future from Commodore. As far as I'm concerned, I'd go for the A600HD model every time.

Andrew Dunbar
Leicester

I agree, the A600HD does seem a good deal – especially when you consider it's probably more expandable than first thought. And once the hardware for the PCMCIA slot starts to appear, the new £299 price for the straight 600 will seem even better value.

PC PLODS

I feel I must write to you regarding the Amiga/PC debate that seems to occupy some of your readers' minds. As I understand it, they believe the Amiga is underspecified compared with the 'cheap' PCs which can be bought for around £1,000 to £1,200. Well, they may be interested to read about some of my experiences with PCs.

I bought a 33MHz 486 PC with a Super VGA graphics card and a SoundBlaster sound board. Even with all this equipment my PC does not rate much higher than my unexpanded Amiga 1500. Whilst the main procesor is undeniably very fast, the Super VGA graphics card is largely useless as I have not seen a piece of software that uses it. It is definitely inferior to the Amiga's Fat Agnus, so bit-mapped graphics manipulation can end up as a painfully slow experience. In addition, I am aware of no PCs under £5,000 which support hardware sprites, BOBs or scrolling in any form.

> *"I am aware of no PC under £5000 which supports hardware sprites, BOBs or scrolling"*

However, the Amiga is not perfect. It really is screaming out for a fast processor and a big hard drive, if anything more than arcade games are to run efficiently.

In my opinion, if you have £1,000 to spend on a PC you would be well advised not to. Buy an accelerator board and hard drive for your Amiga or, better still, wait for the new 'Super Amigas' that Commodore is developing – they should definitely put an end to any ideas of the PC's superiority for years to come.

Robert N Davis
Fareham

Depends on what you want to use a PC for though, doesn't it Robert? You don't buy PCs for their graphics or sound capabilties do you? No, you buy a PC for what it excels at – and that's the cost-effective number-crunching of an unrivalled universe of productivity software on a machine that's infinitely upgradable.

AMIGA ANSWERS

Any thoughts on what I should do? I wish to update my Amiga 500 V1.3. Looked at the A600. Waste of time. A3000 far too expensive. The A2000/A1500, just not sure. Do I wait or do I buy? I've seen a A1500 for £499 but do you get 2Mb of

I CAN LAUGH ABOUT IT NOW...

I refer to an answer that you gave to a reader in the September issue of your magazine and wish to give advice, from experience, that might save your reader some money.

The query was printed on page 37 and was regarding a problem with his MicroLine printer not printing the bottom part of the letters. I had this problem when I first used my word processor, *Wordsworth*, and printer, the Canon BJ10-ex. I was very disappointed and thought that my printer head was broken – however, it was only when Digita, the publishers of *Wordsworth*, sent me the official newsletter that I solved my problem – I had been using sizes of fonts that required larger line spacing. After setting the line spacing to Auto, all my troubles disappeared.

Keep up the good work and continue producing an easy to read, informative magazine.

Andrew Harrold
Aberdeen

Thanks Andrew – a fiver's on its way to you... as there could be to anyone who sends in a lesson learnt from experience. Just mail it to:
'I Can Laugh About It Now, Amiga Shopper, 30, Monmouth St, Bath BA1 2BW.

Chip RAM available or is it 1Mb? I want the full 2Mb ChipRAM and 8Mb Fast RAM.

Several writers have hinted at a new Amiga machine in the pipeline. I've had my Amiga since 1989. I like it, I also have a KCS PC Board fitted, which fits the bill too.

If money allows and I stay in full time employment, I'll also get a cheapish 80486 PC computer.

But as for all the thousands of software titles available, what I have seen is bloody expensive. What a joke. And the Apple Macintosh as well – another bleeding expensive machine with expensive software.

What's the lads' and lasses' set-up at *Shopper* and how can they afford it?

Dave Magill
Cheltenham

I don't know what to suggest as I don't know how much dosh you have. Meanwhile, maybe you should wait for the A2200. As for us lads and lasses here – well we afford the set-up at *Shopper* quite easily – Future buys all the machines and software for us! We have four Macs – Diana has a II, Alison a IIsi, me a LC and poor old Cliff a Classic – though he also has an 8Mb Amiga A1500. There's also an A500 and A500 Plus kicking around somewhere. Diana has a Mac SE 4/40 which she wants to sell for about £900, if you're interested, and Cliff has a Vauxhall Cavalier he wants to sell for around £1500. Alison doesn't personally own a computer but her brother has an Archimedes – though she does have some old clothes she wants to get rid of. And I've got a PC which I don't want to sell though I'm after cheap 1Mb 70ns RAM SIMMs and a soft-top for an old BMW if you've got any. And Cliff's just said he'll sell his body... but I better not print that.

PC QUESTIONS

My firm has just bought £3400 of PC equipment and software for me to use at work. This consists of a 386/25MHz, Star LC15 printer, Mouse, VGA monitor, 40Mb removable HDD and MSDOS 5, *Windows 3.1*, Cardbox plus 4, *Supercalc 5* and *Wordperfect 5.1* software. This is all times two with four hard drives.

You wanna know summat? I think it is the most illogical and user-unfriendly computer system I have ever had the misfortune to use. I have never had so much trouble getting a word processor to print a simple document. Give me my *Excellence 3.0* word processor and my Amiga any time. Anyone who sells their Amiga A500 and buys a PC instead (see last month's letters) must be about 10p short of £1.

Andi Bradley
Lincoln

Good job somebody else bought the kit on your behalf then, wasn't it? Again, all I have to say is you buy a computer for what you want to use it for. An Amiga with *Excellence* and a printer is fine for most people.

PC-CUTION COMPLEX

I am writing to you about several things which are puzzling me. Firstly – prices. Recently I worked part time for a place which sells and repairs PCs. When I showed them prices for Amiga hard drives, and floppy disk drives they were horrified. It seems that we Amiga owners are being ripped off.

For example I quoted the price for a 52Mb drive as being around £360. They showed me adverts for a 52Mb Quantum drive for £150 (the trade price), so at least £120 is being charged for a SCSI controller.

Now I accept that with bulk orders the prices will tumble, and that the Amiga controllers often contain memory expansions, but I could get a SCSI controller for the PC for £10!!

Even allowing for all the differences between the Amiga and PC, surely this is far too great a gap in price to be easily explained away? What is more, for an internal 3.5 inch drive I was quoted £25 by a reputable PC dealer (again trade prices), against around £50 for an Amiga drive.

This time there can be no excuse since these two drives were identical, same manufacturer even. Call me suspicious if you like but isn't someone somewhere making a large profit at our expense?

Edward Moyse
London

There's two things you have to bear in mind here – one, don't get confused over trade prices and retail prices – there's always going to be a vast difference – and two, remember the difference in size of the two market places. There are millions more PCs out there than there are Amigas and hundreds more dealers selling add-ons. Therefore it's only logical there's fiercer competition and bigger price differentials. So I should draw you own conclusions when considering purchases.

> *"Anyone who sells their Amiga and buys a PC must be 10p short of a £1"*

CD-I WINS EASILY

Reading the letters page in *Amiga Shopper* September's issue, I am writing to set the record straight with regards to the letter by Graham J Dix. As an electronics/hardware engineer with considerable experience with Amigas and a *proud* owner of an Amiga for four years, I consider the machine to be *the* best home micro.

I do feel that Mr Dix's comments were out of context. As an owner of a Philips CD-I unit since July 1992 I consider Mr Dix's letter was more of a reaction to Diamond's advert in August's issue of *Shopper* – the advert in question being in bad taste.

Diamond were the *only* company in the UK which had full page adverts seling CD-TV; then they switch their allegiance to CD-I by taking the mickey out of those who bought it!

There are distinct differences between the two systems with CDTV being essentially an Amiga with a CD-ROM drive built-in – there is no disputing that fact.

Mr Dix's comments such as 'the *worst* piece of CD-TV is better than the *best* piece of CD-I software' were completely unfounded. Almost *everyone* who has seen such CD-I titles as *Treasures of the Smithsonian*, *Time-Life Photography*, *Palm Springs Golf* and *Tell Me Why*, will tell you they haven't seen *anything* like it before and that includes senior computer analysts, programmers and teachers, etc...

The overall quality of the sound and graphics in CD-I titles is truly astonishing with Philips supporting its release with 35 titles at the *same time* as the launch of the machine in the UK. The machine itself is state-of-the-art in home multimedia. That's what it's *sold* as and that's what it does!

The point I am making is that there are clear differences between the machines and the technology used in them. Why is Mr Dix making comprisons such as *Simcity*? It has four tracks of music – well, this isn't exactly state-of-the-art! and if Mr Dix was a *real* Amiga user he would be *writing* his letter, *playing Simcity* and *listening* to a *Protracker/MED* module!

My advice is *don't* listen to me or Mr Dix – go and get a demonstration at a Philips dealer!

I rest my case.

Chang Sum
Sheffield

To be fair, the titles you refer to are the cream of the crop – that's not denying they aren't state-of-the-art – it's just that there's CD-I dross out there too. I've seen every CD-I title on release and ready for launch and I have to admit they are largely more impresive than CDTV titles.

But why should this be? *Dosh*! That's what. Besides the CD-I consortium (that's Philips, Sony and Matsushita) owning copyright on loads of films, books and records, they've also pumped money into custom CD-I studios – there's a couple of dozen in the UK alone. Commodore has three things it can counter with though – one, its superior graphics and audio chips, two, the substantially lower development costs of CDTV titles and three, the tried and tested familiarity with the Amiga O/S of software houses.

At the end of the day though, it's software that counts and I'll repeat what I said last issue – for an Amiga owner there's only one choice – and that's the A570. Meanwhile, if you've got the money, buy a CD-I player as well.

RICH BOYS RULE?

I am dismayed at your magazine's 'rich boy' attitude. As a regular reader (indeed a subscriber since issue one) I feel that I have to comment on the increasing number of reviews of products which many 'normal' Amiga users cannot afford.

Your reviews of such expensive products, though they are well written and interesting, are of little

use to the vast majority of your readers. Most of us get by with a few inexpensive peripherals such as a printer or an extra floppy drive and a megabyte of RAM. If I bought all your "essential buys" I would be in debt for the rest of my life.

Furthermore, all you seem to do in *Amiga Answers* is advertise manufacturers of expensive add-ons rather than try to answer the questions. You also seem to concentrate on those who have the most money.

For example, someone wrote to *Amiga Answers* asking why their genlock would not superimpose graphics on to their videos. The outlay for the entire set-up came to around a thousand pounds yet X did not know that the genlock had to be connected to the Amiga. Yes, tell me that X was a beginner etc, but it won't wash. The fact is that beginners shouldn't begin with such a set-up. I mean, people don't learn to drive in Porsches, do they? Furthermore, (though I can't prove this as I don't have the genlock) such information is present in the manuals. This just goes to prove that some people have more money than sense.

> ***"If I bought all your essential buys I would be in debt for the rest of my life"***

My personal view is that if people have such great amounts of money they can go and get professional systems analysts to sort out their problems and leave the problem pages to us wiser, but poorer, mortals.

You also pick on those who have acquired old printers, etc, and who would like to use them without spending a fortune. Most users do not have a bottomless pit of money for what is, after all, mainly an absorbing hobby.

I hope you will take note and change your ways before your excellent magazine befalls the same fate that has afflicted others. You need to cut the reviews and start telling people how to get the most out of what they have. The two hundred tips feature in the August issue was a good start. Keep it up.

David Lambert
Glasgow

Thanks, David. The last thing we want to do is adopt a 'rich boys' attitude, but genlocks, for instance, are pretty expensive items and are used for specialised purposes – they're therefore not used by the majority of Amiga owners. The fact that they are used by some, or are going to be used by some, does need addressing though.

It's my experience that people always want to look at improving their set-up as well as maximising what they already have. So we have to cater for both these needs. Sorry if you think we've got the balance wrong – it's something we'll look into.

VIRAL ATTACKS

Thankfully I have only had one scrape with a virus and that prompted me to investigate PD and shareware antidotes. However, having played around with *VirusX*, *ZeroVirus*, *Master Virus Killer*, *Bootchampion* and *BootX*, I am not so confident that I would know what to do if I found another.

I know that not all unrecognisable bootblocks are necessarily viruses and it is possible with these programs to read the bootblocks to see if there are any tell-tale messages. In addition, it is also possible to compare the blocks with known viruses in the supplied libraries.

I think an article on this subject would appeal to many of *Amiga Shopper*'s readers, especially those who do not understand the significance of vectors such as WarmCapture, CoolCapture, ColdCapture, KickMemPtr, KickTagPtr, Dolo and Sendlo, and why and how they should change if a virus has infected the Amiga.

What is a link virus?, the difference between the whole bootblock and bootblock code, the offset and the value of uninstalling or zeroing the checksum? These are currently some of life's great imponderables!

Thank you for a great read and a constant source of info. I've been with you since issue one and do not intend to change.

Peter Langley
Preston

Viruses, viruses. Yep, good idea for an article and I can't think why we haven't done one to date. The only virus I ever came across was one which made my mouse movements go in the opposite direction – and a right pile of fun that was.

DIY ELECTRONICS

"Make your very own handy hardware add-ons with the help of our special projects features". That was back in the sneak preview issue, remember?

In Issue 1 we had an article on an anti-click board, which was a very useful start. Reading the article, one would be mistaken for believing that we could look forward to making sound samplers, virus protectors, MIDI interfaces, etc, Instead we've had nothing. Why?

I'm not suggesting that you're expected to design and develop projects, you made that quite clear in the anti-click article. However, it strikes me that you should be as comprehensive as possible when it comes to being "the only monthly magazine totally dedicated to the serious side of the Amiga".

Surely you could run an article on what appears to be an ideal product to test, which is the interface/modules kit currently available from Switchsoft.

It doesn't take too much imagination to see the possibility for publishing readers' articles based on the use of such a product. Or does it?

Anthony Croxford
Merseyside

OK, OK, OK. I like it. Let's hereby kick it off then shall we?

Right, any readers out there who've hooked up their Amigas to any self-assembled hardware, then why not write and tell us how you did it? We'll pay £70 for each one we print.

But here's what you should do. Send a photo or two of the set-up along with a 1000 word description of what you bought, how much it cost, how you fitted it, how long it took and what it does (preferably either on disk or typed).

Then stick it all in a bag and post it to: Amiga Projects, Amiga Shopper, 30, Monmouth St, Bath BA1 2BW

> ***"DIY projects? We'll pay £70 for each one we print"***

STAY THERE FOREVER

Congratulations on getting the latest issue of *Amiga Shopper* on sale in Hong Kong two weeks earlier than ever before. Even at a price of HK$50 (£3.50) it's always been worth waiting for. The reduced wait cheered me up after mourning the death of the 500! Thanks!
PS Thanks for Chris Patten!

Pete Alex
Kowloon

Glad to hear we're reaching such far and wide places, Pete. We had that Chris Patten in Bath for a while but decided to upgrade. Keep him for as long as you want with our blessing.

SUGGESTIONS

At this precise moment in time, I think that your mag is the best thing ever to hit the Amiga scene and the shelves of WH Smiths.

However, I have a few suggestions to make your mag even better...

Why don't you include a list of bulletin boards. I mean, there's bound to be hundreds of sysops out there seeking a mention, and I personally wouldn't mind shelling out an extra few pence for this service.

Also, there appears to be a lack of PD game reviews. I know that you have a "no games" policy, but I have been brought up with the fact that PD includes everything from Hex-editors to demos, and when you say that you review PD, that's what I want to see.

I'm not saying that you should review commercial games though, because some of them aren't worth the disks they're bunged on, but PD is PD. Thanks for listening.

Neil Boothman
Carlisle

I think we could take on the idea of bulletin boards you mention – any Sysops out there wanting publicity just send your details to 'Baud beyond belief', Amiga Shopper, 30, Monmouth St, Bath BA1 2BW and we'll print 'em free. Make sure you include the baud rates, the charges (if any), the on-line times and your special interest areas. Remember, we won't even consider anything that smacks of piracy.

But as for PD games – the answer is no. We're just not interested in wasting the space.

SPOT THE DIFFERENCE



Andy Storer, former East Enders star (left) and Dirty Den, current *Amiga Shopper* editor (right). "Are they by any chance related?" asks Simon Quantrill

Have you noticed the page 3 fella looks remarkably like Dirty Den?

Simon Quantrill
Suffolk

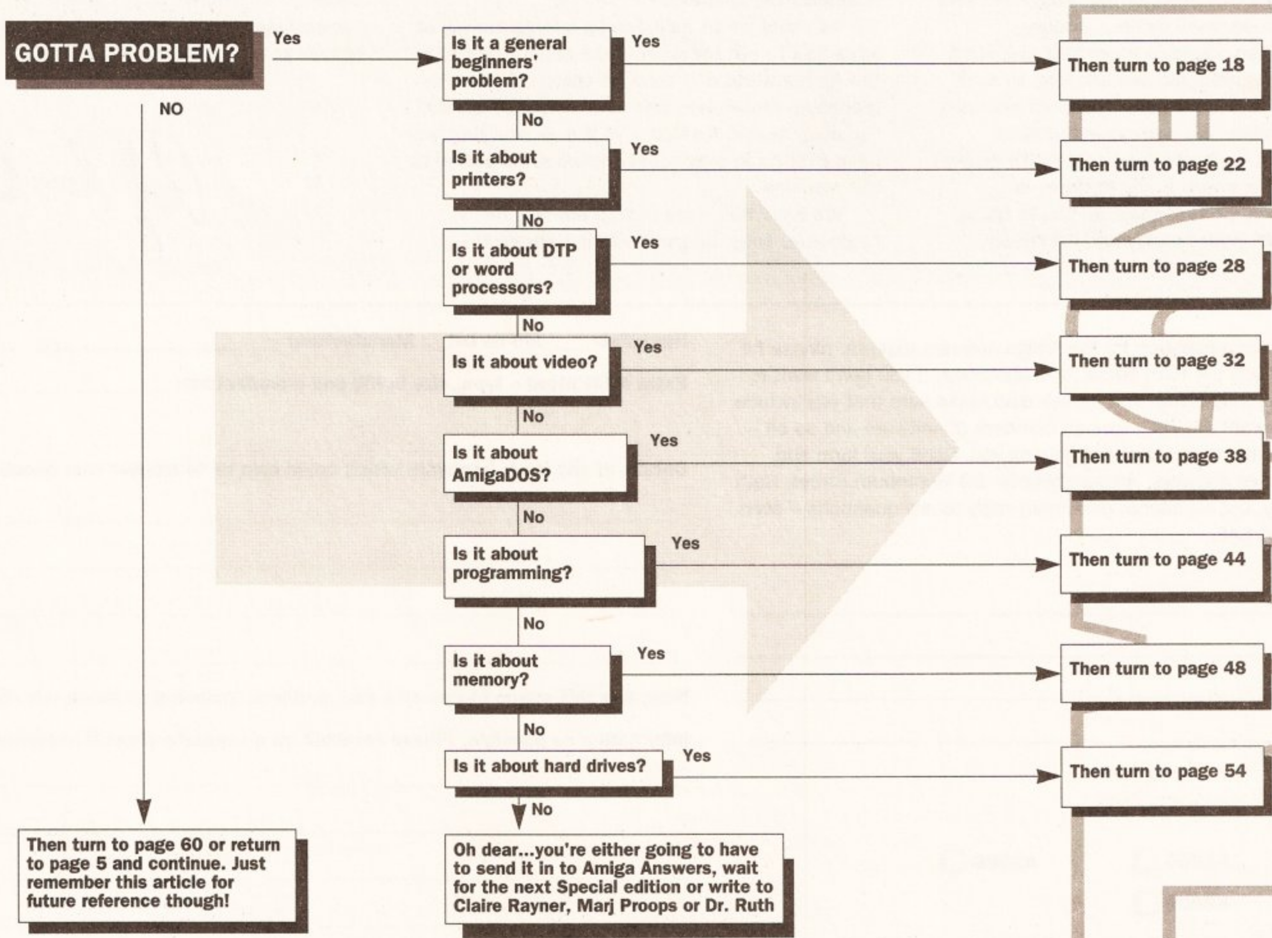
Page 3 fella, me? – Cor Blimey guv!

YOU GOT A VIEW? WELL SEND IT TO! :

Andy Storer, Talking Shop, Amiga Shopper, 30 Monmouth St, Bath BA1 2BW.
Go on! – be a part of the international Amiga World!

OUR EXPERTS TACKLE YOUR REAL-LIFE PROBLEMS

AMIGA ANSWERS SPECIAL



YOUR PROBLEM-BUSTING GUIDE STARTS HERE!

SO WHAT DO ALL THOSE ICONS MEAN?

Beginners: this icon will appear next to any questions which are 'basic' in content.

General: this icon is used for any general Amiga-related queries.

Caution: be sure that you fully understand the answer before trying it out.

Danger: the answer to this question could well invalidate your warranty – or you!

Hardware: this icon is used to denote questions relating to general hardware.

Buying advice: we use this icon if the question asks us for buying advice.

Printers: this icon denotes a query about printers, printer drivers and so on.

Technical: any queries about programming will have this icon next to them.

Video: this icon relates to any query about using your Amiga with video hardware.

Music: this icon is for questions about MIDI, sampling, synthesizers and so on.

Programs: any program-specific queries have this icon next to them.

Comms: if your question relates to comms, this is the icon that we'll use.

NO PROBLEM!

This is, quite simply, the biggest section of *Amiga Answers* that we have ever printed: 32 pages chock full of your problems and their solutions. The reason being that those problems just keep flooding in, and someone has to sort them out.

But this month, because it's a special edition of *Amiga Answers,* we've decided to do things a little differently. We've divided the whole lot up into the major areas in which the Amiga is used: beginners queries, hard drives, memory, AmigaDOS, video, desktop publishing and word processing, programming and printers. In each section you'll find answers to the most common problems found in that corresponding field.

In addition, each section begins with its own easy to use flow chart. Some of these are trouble-shooting guides, enabling you to trace the cause of an error quickly and intuitively, others give a guide to the equipment you will need in order to achieve particular results. These flow charts offer information in an indispensible, 'at-a-glance' format which we hope you'll turn to time and time again.

At any rate this *Amiga Answers Special,* will be one to keep handy. Who knows what problems might beset you in the future? And wouldn't it be nice to know that you already posessed the solutions?

As usual we've called upon a large variety of expertise to put together these pages. No-one in the Amiga world can know all the answers – the machines themselves and their software are far too complicated for that – so it's as well that we have experts in every conceivable area related to the machine.

We have Wilf Rees paving the way for beginners, Toby Simpson offering advice to programmers, Mark Smiddy elucidating AmigaDOS and recalling facts about memory, Jeff Walker offering words of wisdom on word processing, desktop publishing and printers, Gary Whiteley making things clear with video, and Jason Holborn getting your hard drives back on the road.

Next month we'll be returning to our usual *Amiga Answers* format, so keep those questions coming. No problem is too simple, no problem too serious – we're here to offer the balm of reason to your troubled brows.

Cheers,

Cliff Ramshaw

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, but we cannot personally reply to any questions – even if you include an SAE.

Name: ______________________

Address: ______________________

____

____

Your machine:

A500 ☐ **A1000** ☐ **A1500** ☐

A2000 ☐ **A3000** ☐

Approximate age of machine: __________

Kickstart version (displayed at the 'insert Workbench' prompt)

1.2 ☐ **1.3** ☐ **2.x** ☐

Workbench revision (written on the Workbench disk)

1.2 ☐ **1.3** ☐ **1.3.2** ☐ **2.x** ☐

PCB revision (if known). Do not take you machine apart just to look for this! __________

Total memory fitted (see AVAIL in Shell for 1.3 Workbench) _______

Chip memory available (see AVAIL in Shell) __________

Agnus chip (if known) __________

Extra drive #1 (3.5"/5.25") as DF_: Manufacturer __________

Extra drive #2 (3.5"/5.25") as DF_: Manufacturer __________

Hard disk: ____Mb as DH__: Manufacturer __________

Extra RAM fitted – type, size in Mb and manufacturer __________

Details of any other hardware which could help us to answer your question:

____

____

____

____

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

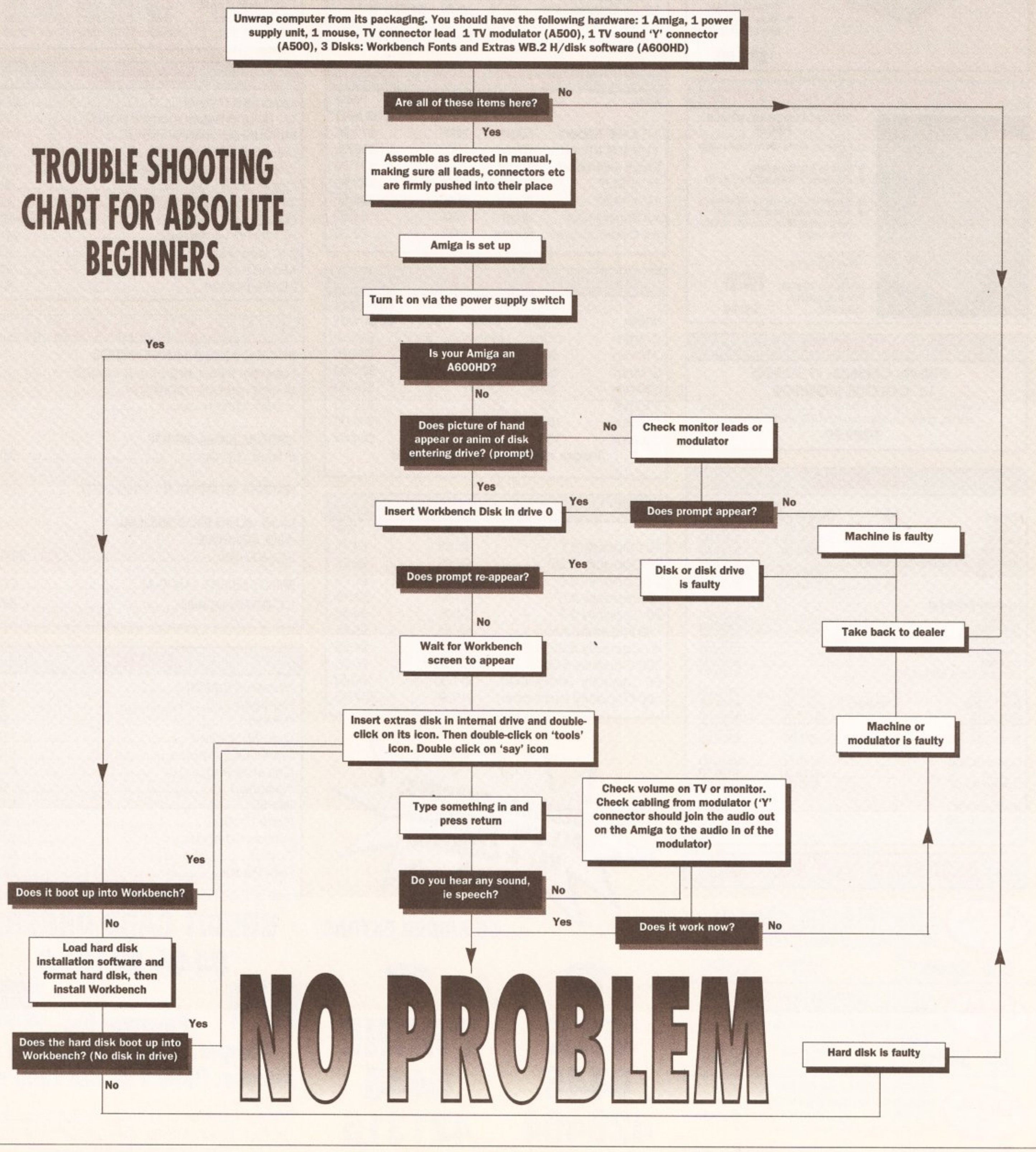
____

AS 18

BEGINNERS...

Just got your Amiga out of the box and already come unstuck? Wilf Rees answers the questions which newcomers frequently ask...

TROUBLE SHOOTING CHART FOR ABSOLUTE BEGINNERS



DOS BASICS

I am a newcomer in the Amiga area, never previously owning a computer. Manuals seem to baffle me. I'm struggling with Workbench but finally getting somewhere. The manual continually refers to AmigaDOS and occasionally, AmigaBasic. What is the difference between them? Can I use them to learn about the disk operating system? Please help.

Iain Woodlaw
Sunderland

AmigaDOS is the disk operating system of the Amiga. You can access this by loading Shell from Workbench. Shell creates an interface for commands that you enter. For instance, you can load a program in Shell just by typing in its name, eg:

```
workbench:utilities/say
```

This will load the "say" program which is in the utilities drawer of your Workbench disk.

You can also list the contents of a disk by typing...

```
dir workbench:
```

AmigaBasic, on the other hand is a pure programming language, for writing your own programs. It is however, quite a dated language and there are many newer languages that have superseded it in terms of speed and flexibility.

AMIGA QUERIES

I am hoping to sell my computer soon and get a new Amiga. I have got my eye on the A1500. I have seen an advert from Hobbyte in your magazine which sells an A1500 and Philips CM8833 MkII Monitor for £695.
1) Does the A1500 have similar specifications to the A500 Plus?
2) Can Action Replay have a virus? If so, how can you kill it? Mine is acting up a bit so I was wondering if it might be a virus.

Elliot Newsome
Rhyll
Clwyd

1) The A1500 is quite similar to the A2000 due to the fact that they both share the same motherboard. On this motherboard there is an ECS Agnus, allowing 1Mb total Chip RAM (not the same Agnus as an A500 Plus.) The 2.04 Kickstart ROM is fitted, but only the normal Denise is fitted (no extra screen modes, such as super-high-res etc).
2) There is no way that Action Replay could have a virus as all the software is contained in a ROM, so the virus could not write to that memory. It is possible, however, that a virus is being loaded into the RAM of your computer from disk, and clashing with the Action Replay ROM software. The answer to all of this is to check your disks for viruses!

PD FONTS ON HD?

I have bought various PD fonts and have been unable to save them to hard disk. When I call up the Shell which is on Dh0: (my hard disk is partitioned into 5) and type Copy fonts to dh0 fonts, it states it cannot open disk in DF1:. Also, when I ask for DIR DF1: I get the same answer. I know that the PD disks are OK as they load satisfactorily into *DPaint*, which is also on dh0: I've tried Copy df1/fonts to dh0/fonts to no avail. I would appreciate your help.

RA Thorne
Henley
Oxon

Before I answer your question, is it really necessary to partition your hard disk into 5?

To copy the fonts from a disk in df1 (presuming that the directory of df1 looks something like this...

```
l          (dir)
fonts      (dir)
.info      fonts.info
readme.txt
```

The fonts would usually be contained in the fonts directory of that disk, so you'd type this into the Shell...

```
copy df1:fonts all to ↵
dh0:fonts
```

This command copies all the files and sub-directories that are in the drawer 'df1:fonts' to the drawer 'dh0:fonts'.

SPACE QUOTATIONS

How can I access a file or directory which comprises of two words or numbers with a space between them? When I do this manually, by using the space bar, AmigaDOS only recognises and accepts the first word. There is nothing specified in the manuals to help me, so please can you?

Phil Taylor
Haverhill
Suffolk

To access a directory or file which has a name comprising of two or more words separated by blank spaces, you enclose the entire path in quotation marks, eg...

```
copy "df1:art/Mona ↵
lisa.iff" to ↵
"df0:Lo res/Iff Portraits/"
```

The point to remember is that the device name (df1: dh0: etc.) has to be enclosed in the quotation marks along with the file or directory name.

ACCELERATOR BLUES

In the background of my Workbench disk I enjoy playing soundtracker modules, using *Noiseplayer*. Ever since I bought an accelerator (Microbotics VXL-30-25) I've noticed that the occasional drum beat or sound is missed out, leaving the song sounding rather odd. I've tried using other music players, such as *Chameleon* and *Intuitracker* but the same effect occurs. Can you suggest a way of fixing this problem or any software that does not have this "accelerator unfriendly" bug?

G Earston
Leeds

You are right in saying that these programs are accelerator unfriendly. The programs you mentioned all receive their timing from sources such as screen frequency and cycles of the CPU clock Because these sources may vary from screen to screen, ie 50hz PAL to 60hz NTSC and CPU speed 7.14Mhz to 25Mhz as in the case of the Microbotics VXL-30-25, the timing of the module is not always as it was intended to be, due to the interleave between the Amiga bus and the accelerator bus, which is not divisible into the timing of the module. The only one which springs to mind is *Medplayer*. This uses the real-time clock as a source of timing and is therefore accelerator friendly. This utility comes with *MED* or *Octamed* and is available from most PD libraries. The only snag is that you will have to convert the module to a *MED* file to play it.

PROTECT 'EM ALL!

I have a Workbench 1.3 Amiga 500 and I'm starting to use it for things other than games. I had a go at "cracking the shell" and I am now fairly competent at using AmigaDOS, but I was wondering how you protect multiple files from deletion, because wildcards just do not work! I've tried "protect workbench1.3:c/#? –d" but this just leads to the message "protect failed" How can I protect many files at once?

Nelson
Hammersmith

There is a script file in the S: directory of your Workbench disk called spat. This script file enables you to use commands with wildcards which normally do not support them. The correct syntax for this command in your situation is...

```
execute s:spat protect ↵
workbench1.3:c/#? -d
```

Spat uses the list command, re-directing the output to a file in ram:, which is a list of all the filenames with text inserted to run protect for each filename which is covered by the wildcard. If you type this...

```
execute s:spat protect ↵
s:#?startup#? rwed
```

the script file in RAM would look something like this...

```
protect s:startup-sequence ↵
```

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

ROM – An area of memory which contains all the information of the computers operating system. ROM stands for Read Only Memory, as the computer cannot write information to this type of memory.

RAM – A different area of memory which is used to store information or to load programs into. RAM stands for Random Access Memory.

Megabyte – A thousand kilobytes (K), often abbreviated to Mb, popularly called meg.

Trapdoor slot – The slot underneath an Amiga A500 or A600 which enables further expansion, eg memory expansions, emulators etc.

Emulator – A program or piece of hardware which makes your computer act like another computer, eg an Amiga emulating a PC.

Printer Driver – A file that is usually found in the DEVS:printers/ directory of your Workbench disk. This file controls the printer, converting the Amiga's raw output into a language that your printer will understand.

Startup-sequence – A file found in the S: directory of most bootable disks. This file is a sequence of commands or programs run during boot-up.

```
rwed
protect s:startupII rwed
protect s:shell-startup rwed
```

The script file is then executed by spat. and the relevant files will be protected.

NO ADDRESSING!

How can I try and run AmigaDOS commands from ARexx? I've tried ADDRESS AMIGADOS and ADDRESS DOS, but it always seems to tell me "host environment not found." What is the name of the environment that is to be addressed to execute AmigaDOS commands and how do you go about doing it?

Douglas Bealey
Lancs

The name for the environment to address is "COMMAND" and you address it as follows...

```
Address COMMAND
'c:copy' filename 'to' ↲
destination_dir
```

This previous extract, with the variable "filename" being "c:dir" and the variable "destination_dir" being "ram:" will send "copy c:dir to ram:" to AmigaDOS. This works by sending anything that is surrounded by quotes directly to the environment being addressed and anything that is not surrounded by quotes is a variable or expression that is to be sent. To go back to Rexx commands, simply type:

```
ADDRESS REXX
```

Then continue your Rexx script as normal. Happy addressing!

NO DIET FOR AGNUS!

Who is Agnus? Why is she getting fatter and fatter? Are Paula and Denise sisters? What's enhanced about the ECS?

Gary Ilmoor
Stoke-on-Trent

Increasing demand from the users of Amigas for greater hardware capability has lead Commodore to update its machine to cope with these needs. The Agnus chip was updated to enable the user to have more "chip" memory (memory used for storing samples, graphics etc). The newer Agnus chips were bigger, with more Chip memory available, hence the term Fatter Agnus. While the Agnus chip was being superseded by larger, more powerful chips, the other chips, Denise and Gary were updated. Denise is the screen handling chip. It deals with all the screen resolutions and graphic modes. This chip was updated to the ECS version by the addition of some more screen modes:super high-res, Productivity and a load more. This was because the average user was expecting better resolutions than the standard ones that the earlier Denise chip offered. Paula deals with all the sound of the Amiga and the data received from the disk drives and input/output ports.

FULL OF EXTRAS!

I'm using Amiga Basic on my Amiga 500 and I am having difficulty saving files. A box appears for me to type into, but the Amiga spurts up a requester saying "Volume Extras1.3 is full" I've tried putting blank formatted disks in the drive where the extras disk was, but the computer just says "please replace volume Extras1.3 in any drive" Is there any way in which I can get round this problem, without having to delete files from my extras disk?

R Winter
Rhyll

Yes, there is. When you type the name of the file you wish to save in the box, you have to state the path where you are saving it. The Path means where the file is to be found. An AmigaDOS disk is structured into drawers which are ordered into a hierarchy. A drawer on a disk may contain files or other programs, but it may also contain another drawer. For example, if the file "myprog" is in the drawer "basicfiles" which is on the disk "programs" From AmigaBasic, you would type the following to load the file "myprog"...

```
load ↲
"programs:basicfiles/myprog"
```

If you break this statement down, you will see that the disk is called "programs:" remember, when you type the disk name in, you have to put a colon at the end to tell the computer that you are referring to a disk and not just a drawer. Next, you will see that there is a slash sign "/" separating the "basicfiles" drawer from the "myprog" filename. A slash sign works by indicating to the computer that the next name you are giving is inside the drawer before the slash sign. This example of another path shows the structure method:

```
df0:drawer1/drawer2/ ↲
drawer3/filename
```

The example shows that 'filename' is in 'drawer3', 'drawer3' is in 'drawer2', 'drawer2' is in 'drawer1', 'drawer1' is on disk 'df0'.

So, for example, if you want to save your file on a disk which you have previously named 'programs' and you want to save it in the 'basicfiles' drawer of that disk (that you have created also) then type the following into the Amiga Basic window:

```
Save "Programs: ↲
basicfiles/MyProgram"
```

SCART ART!

I use my Amiga 500 mainly for graphics, with *DPaint IV*. As my passion for drawing has increased, I decided to go for a monitor, possibly the Philips 8833 MkII. I was later told by a friend, that I was better off getting a TV with a 'scart' socket on it. What benefits will a 'scart' socket give me and what do they do?

Ben Peatsfield
Essex

A scart socket on a TV is a socket that allows direct access to the tube of a TV for a computer. This bypasses all the tuning circuitry, thus giving a crisper image. Even though the quality is usually a lot better than a conventional TV, the image is not as crisp as what you would see on a monitor, like the Philips 8833 MkII. The main problem to look out for is that even though a scart socket is supposed to be a standard, (set by Philips) not every manufacturer sticks to this standard, often deviating in the wiring of the socket. In these cases, a lead would have to be made up, which would cost more than a standard scart lead. The bonus you do get by buying a monitor TV, is that when you get tired of zapping aliens, you can just flip over to a TV channel. You will of course need an aerial.

FORMAT?

I am new to Amigas and I don't know much about the way they work. One manual stated that it needed a blank formatted disk to save to. What does it mean to format a disk? Why do you have to do this? How do you do this?

A Leihley

Formatting a disk is a process by which the disk is prepared to receive information. On a disk surface, there are loads of microscopic magnetic particles strewn about in a random manner. For a disk to receive information, these particles have to be in a uniform configuration. You format a disk by putting it into your disk drive, and waiting for an icon to appear which has the writing "df0:????" below it. Click on this icon with the left mouse button, hold down the right mouse button and move the mouse pointer up to the tools menu and select "format disk" by holding the right mouse button over it and letting go. You will be asked for confirmation of this process, and all that you have to do is click, with the left mouse button on "OK." Of course the disk must be write enabled – this means closing the little black slider on the bottom left-hand corner of the disk. When the slider is open, ie you can see through the hole, then the disk is write-protected, which means it is not possible to write data to the disk. You should make sure you write-protect all of your disks with programs on, to ensure you do not accidentally over-write important information, and also to ensure the disk is not attacked by a possible virus.

DF... WHAT?

What on earth is df0, df1, etc? I keep on being expected to know what they are, but never really understand.

AB Ginner
Knutsford

Df0 is the name given to the disk drive number zero, or the internal drive. It stands for Drive Floppy 0. The number can range from zero to four, as the maximum floppy disk drives that the Amiga supports is 4.

When you refer to the drive, df0 you always place a colon ":" at the end, in the format "df0:"

AMOS ANGST

After reading a few issues of your magazine, I am thinking of getting an Amiga. In many of your magazines you refer to something called AMOS and AMOS 3D. I was impressed with the graphics screenshots that you showed, but I was confused. What actually are AMOS and AMOS 3D?

B Johnstone
Cheshire

AMOS is actually a programming language similar to Basic. It is aimed at a person with an intermediate level of competence with computers, although there is a beginner's version of AMOS called Easy AMOS which is a fun and quite versatile language for a beginner. Both versions of AMOS provide a powerful language for any user, giving access to all the Amiga's facilities, including sampled sounds, and beautiful graphics. It is a superb language for writing games and demos. My colleague Jason Holborn writes a regular AMOS column for *Amiga Shopper*, and has dealt with many of the features AMOS offers. Look him up this month, or, if you wish, you can buy back issues to have a

complete course in some of the tasks Jason has handled.

PINS 'N' NEEDLES

What is the difference between 9 and 24-pin printers? I'm thinking of getting a printer for word processing, when I purchase my Amiga 1500. Could you recommend a certain printer? (It has to be able to do colour, for the purpose of graphics printing.)

Robert Wilkinson
Herts

The difference between 9 and 24-pin printers is the number of pins that are fired at the ribbon, which in turn, hit the paper to produce a dot. 24-pin printers can print higher detail than 9-pin printers as the pins are smaller, hence smaller dots. 24-pin printers are far superior for text output, the letter styles are crisper and have finer detail, but for colour graphics, some prefer the output of 9-pin printers. The 24-pin printer which consistently comes out tops in reviews is the Citizen Swift 24e (£269). This printer has a wide selection of typefaces and the graphics output is very good. For cheaper 24-pin colour, you could try the Citizen 224 (£199). Have you looked at non-impact printing, such as the Canon Bubble-jet and the Citizen project? (£359) ☎ Silica 081 309 1111.

WHAT ARE VIRUSES?

What are computer viruses? When I get one on my Amiga, will I have to call the GP if it gets one?

B Shutton
Southport

Computer viruses are small programs, written by illegal programmers, which spread from disk to disk, often causing havoc as they write themselves to another disk. These viruses are often designed to work without the operator noticing, spreading until something bad happens, ie information is lost. The Amiga is particularly susceptible to viruses, due to the fact that when a disk is inserted, the Amiga reads the disk, and the virus is transferred into memory, ready to write to another disk that is inserted.

There is light at the end of the tunnel! Many programmers have been writing programs to deal with these viruses. These programs are usually very effective in the fight against viral infections, some even have the facility to learn new viruses, effectively vaccinating your computer against them. The commonest source of viruses is pirate software. You think obtaining an expensive game for the price of a disk is a bargain? It's not. Dozens of software houses go to the wall because their product is effectively stolen, and the fewer the number of firms producing software, the less diverse the range of titles available. The easy solution to avoid viruses is, firstly to use only bona fide software, and secondly keep your disks write protected.

PRINTER DRIVER?

I have recently bought an Amiga 500 Plus and a Citizen Swift 24 Printer. I use *DPaint III* to draw pictures and other diagrams. When I tried to print it out a problem occurred. The output was just a mess of silly characters (over 20 pages of it). I then went into Printer preferences and saw that the computer was set up for an "Epson X" Could you tell me why this is? I do know that the cabling and the printer are OK.

Anon

The problem is that you need to put the correct printer driver on the disk that you boot up from. The correct printer driver for your Swift 24 is called "EpsonQ" To install this printer driver, you will need to re-boot with your Workbench disk and go into Shell and type:

```
Copy extras2.0: ↵
devs/printers/epsonQ to ↵
DpaintIII:devs/printers/
```

Then follow what the requesters say, inserting the correct disks when you are asked. (If you've named your Workbench disk something other than Workbench 2.0 then you will have to change that section. The same applies to Extras 2.0.) Then, making sure that you have booted up from your *DPaint* disk, you will need to open printer preferences from the Workbench disk and select the correct printer driver (EpsonQ).

If you are booting up from your Workbench disk to use *DPaint*, then you will need to type the following into Shell, after booting up with your Workbench disk...

```
copy extras2.0/devs/ ↵
printers/epsonQ to ↵
workbench2.0:devs/printers/
```

You will then need to go into printer prefs and select the correct driver for your printer. Now *DPaint* should print out properly.

FAREWELL OLD ENGLAND

I bought an Amiga 1500 a few months ago, and have really just got into using it, mostly for writing reports for work. My company is moving myself and my family to Bermuda, and while I relish the thought of sub tropical beaches and palm trees, will my Amiga still work OK, and will I be able to buy American peripherals to continue expanding my system?

R Butchert
Aberdeen

I'm delighted to tell you that the mains system in Bermuda will offer no problems for your Amiga 1500, apart from which, most of the internal cards and peripherals take their power from the Amiga's own internal power supply, so the nearby American market will be available to you. There may be possible setting up problems requiring the services of an expert to rectify this situation, so please do not feel at all hesitant in seeking my assistance, just send return flight tickets (one also for my wife) to *Amiga Shopper*, marked 'Personal Attention of Wilf Rees', and your problems will be sorted!

SOUND SENSE

I have recently upgraded my hi-fi system and have the amplifier and speakers from the old system going spare. I bought the *Cartoon Classics* pack, and was wondering if I could use my old hi-fi to improve the quality of sound output from the current system which uses a Commodore 1084S. Unfortunately the inputs on my amp are 5-pin DIN sockets. Are the two systems compatible?

A Plover
Sheffield

Judging by the fact that you mention it is an old hi-fi system, I expect that there is an option on it to select aux input. The 5-pin din socket would be the input through which the aux signal is sent. It is likely that the input is a line-in type of input. The Amiga's output is equivalent to a line-out on a tape recorder, so connecting your computer to the hi-fi will be possible. I cannot tell you the connections as they vary from hi-fi to hi-fi and you didn't tell me anything about yours, but I'm sure that you will be able to find them out by ringing the manufacturer.

ACE ANIMATIONS

I got an Amiga 500 Plus for my birthday, and am really enjoying learning how to use it. The package came with lots of games, which at first were fun, but I'm starting to get bored with them. What i would really like to learn, is how to do really clever animations, such as you see in *Space Ace*. What software do I need to do this? I am 12 years old, and I have a 1.5Mb expansion board as well as the standard 1Mb. and a second drive. Do I need a video camera to get the cartoon effects?

Peter Walker
Swindon

Firstly, I'll get something straight: you don't need a video camera to get the cartoon effects. What you do need is an animation/paint package like *DPaint IV* or Walt Disney's *Animation Studio*. Both packages employ the "onion skin" effect. This is an effect by which the previous few frames of an animation are shown, underneath the current frame. This facility is used by professionals, using clear acetate. You seem to have enough memory to do animations to start off with, but you may want more memory as you progress.

A600 SUPPORT?

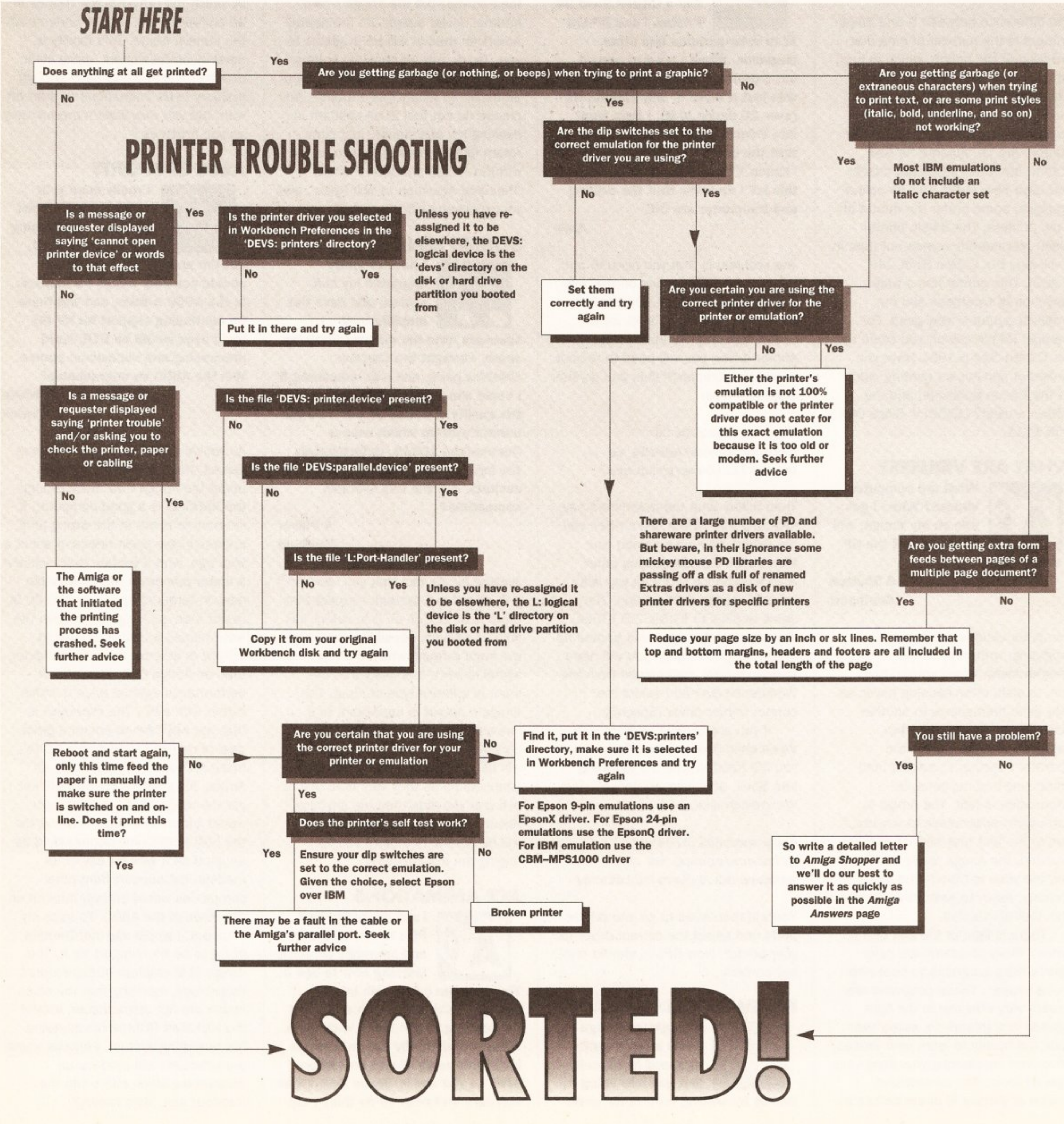
I really need your opinion. I have been seriously considering the Amiga 600HD, but I'm unsure about whether I should consider a 386 PC instead. Is the A600 a dodo, and will there be continuing support for it? My main uses would be DTP, word processing and occasional games. Will the A600 be upgradeable?

R White
Keswick

As you've probably read in previous issues, there are mixed feelings about the Amiga 600. Even though the A600HD is a good computer, it seemed to come at the wrong time. It should have been released about a year ago, with a version that included a faster processor being available now. In terms of speed, a 386 PC is faster than an Amiga 600, even the base model, a 386sx running at 16Mhz is at least three times faster than an Amiga 600. The ratio of performance against price is much higher with a PC. The drawback is that you will have to spend a great deal of money souping up a PC to make its sound compete with an Amiga. Also, with a PC, you will not get the range of PD software you would get on an Amiga. Support for the 600 from Commodore would be as good as it was for any of its models, but support from other companies would entirely depend on the sales of the A600. To stick my neck out, I would say that there is going to be the support for it. The Amiga 600 employs surface-mount technology, meaning that the chips inside are not upgradeable, except the Kickstart ROM which contains the operating system. Perhaps some manufacturer will produce an accelerator which plugs into the trapdoor slot. Who knows?

PRINTERS...

Problem with your printer? Whether it's to do with scanners, drivers preferences or even ribbons, Jeff Walker's got the answers



PRINTING PUZZLE



I have a DaataScan Professional hand scanner with data switch. My machine is an Amiga 500 converted to 1Mb Chip RAM. It has a GVP 52Mb hard drive fitted.

When I try to print from *Deluxe Paint II* or *PageSetter* the whole machine goes crazy, but only when using the EpsonX[CBM_MPS-1250] printer driver. I get some sort of output using the EpsonJX80 driver.

The problems happen only if I boot the hard disk, if I boot from floppy everything works fine. Below is a copy of my startup-sequence, in case that helps.

```
assign t: ram:
run >nil: fastmemfirst
assign Scribble!: ↵
Word/Platinum_Scribble!
assign DICT: ↵
Word/Platinum_Scribble!
assign Scribble!:
WorD/Platinum_Scribble!
assign DICT: ↵
WorD/Platinum_Scribble!
assign Scribble!: ↵
WorD/Platinum_Scribble!
assign DICT: ↵
WorD/Platinum_Scribble!
loadwb
run >nil: mymenu/mymenu
run >nil: v- ↵
checker/virus_checker - ↵
100 -t13
run >nil: blanker/blanker
system/setmap gb
ASSIGN FONTS: fonts:
endcli >nil:
```

RC Whinnerah
Letchworth, Herts

This is a difficult problem to track down, it has to be done by a process of elimination.

I'm glad you sent me your startup-sequence because there are a few things in there that need either removing or changing. First, you are assigning the logical devices Scribble!: and DICT: three times, so leave the first two Assign statements in and remove the four that follow.

Next, in the second from last line you have assigned the logical device FONTS: to the logical device FONTS:. This would seem a fairly pointless thing to do. Change it to read...

```
Assign FONTS: SYS:fonts
```

The SYS: logical device is assigned to be the root directory of whatever disk you boot from.

Right, now that's sorted out, let's try to track down your printing problem. The best clue we have is that the problem goes away if you boot from floppy. This suggests that one or more of the files required for printing might be different on the hard disk than on the floppy.

Assuming you want to use the EpsonX[CBM_MPS-1250] printer driver, here's a list of the files that need to be present, and where they need to be...

```
DH0:devs/printers/EpsonX[CBM_MPS-1250]
DH0:devs/printer.device
DH0:devs/parallel.device
DH0:L/port-handler
```

To make sure the hard drive contains the same files, copy those four files from your boot floppy into the correct places on your hard drive, re-boot with the hard drive and try a print-out.

If it still plays up, remove from your startup-sequence the lines that run the mymenu, virus_checker and blanker programs, and try again; it's possible that one or more of these PD programs is interfering with *Deluxe Paint II*, *PageSetter*, or the printing process.

If that doesn't work. Switch everything off, remove the data switch, plug the parallel cable into the Amiga, switch on and try again.

If after all that it still plays up after booting from the hard drive but works OK when booting from floppy, it (obviously) must be something else.

You've only given me one more clue. On your question form you've written down the number 515,400 next to Total Memory Fitted, and 1,040,216 next to Chip Memory Available. How can you have more Chip memory available than total memory fitted?

If this is correct, there's something wrong. The 8372A Agnus and 1Mb Chip memory upgrade only works with the 4-chip 512K trap door expansions, if yours is one of the older 16-chip models (like the CBM A501) you will have all sorts of problems. It might be worth checking this out before you do anything else.

NL RIBBONS



I have an old Star NL-10, still giving good service, but I am unable to obtain a replacement ribbon cartridge.

The ribbon I am using has frayed at one point and occasionally jams. I believe I need either the complete cartridge or a ribbon sub-cassette, but I can't find a supplier.

JH Wade
Old Harlow, Essex

Caspell Computer (0202 668208) is advertising Star NL-10 ribbons for sale at £4.95 each. Not sure if this is the 'cartridge' or 'sub-cassette' that you mention, so you'd better ask before buying.

HOW DO I KNOW?



In the near future I plan to print out black-and-white images created with a ray-tracing program, and I suppose an inkjet printer will do fine for this job. But how can I be sure that the printer I see in the shop will work properly with an Amiga?

There are quite a few printer drivers on my Extras disk, but since the time they were written dozens of new printers have arrived on the market. Is it possible to get these printers to work with the Amiga?

And what is 'printer memory'? I read an article about laser printers in an MS-DOS magazine, and they spoke about 2Mb of internal memory installed in the printer being the minimum requirement for the printing of graphics of some sophistication. Does this count for the Amiga too? If so, how much memory do I need for printing ray-traced graphics?

Igor "The Tulip" Wesdorp
Amsterdam, Holland

The way the Amiga works with printers, via independent printer drivers, is a wonderful invention. But it means that it will only work with printers for which there is a specific or compatible driver. And it also means that the quality and speed of the print-out depends on how well the printer driver has been written.

Luckily most new printers include emulations for older printers, and while this means that you might not be getting the best out of the printer, at least you can use it until such time as there is software (or a printer driver) that supports it.

The safest emulation to check for is 24-pin or 48-pin "Epson LQ" emulation. The most popular emulations are LQ-850, LQ-1000, LQ-1050, LQ-1500 and LQ-2550, but if the printer can emulate Epson LQ-500 or above, then there are Amiga preferences printer drivers that will work with it. EpsonQ on the Extras disk will probably work, but it isn't really good enough; what you need is a driver called Star24Plus, which was written specifically for the Star LC24-200 printer, but will work with all Epson LQ emulations above LQ-500.

Star's Amiga printer drivers are available in the UK directly from Star Technical Support on 0494 471111, although they'll possibly not be too happy about wasting time with owners of non-Star printers. You can also get them from *Just Amiga Monthly* on 0895 274449.

IrseeSoft's *Turboprint Professional* will also drive these Epson LQ emulations and gives you the advantage of being able to alter the dither patterns, the brightness and contrast levels of print-outs.

At this moment there are no satisfactory Amiga preferences printer drivers for Hewlett-Packard printers. Sure there are a couple on the Extras disk, but they are old, slow, and only work properly with the original DeskJet and LaserJet models. *Turboprint Professional* includes support for the DeskJet, DeskJet 500 and DeskJet 500C. If the printer you intend to buy emulates a DeskJet, then *TurboPrint Professional* will almost certainly drive it. It'll also drive LaserJet II

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

ASCII – American Standard Code for Information Interchange is the data storage method commonly used when we type text files; it enables data to be exchanged between different computers and to be sent to printers.

Compugraphic fonts – Rather than a simple bit-mapped image of each character, which grows more jagged with magnification, the characters in a Compugraphic font are each represented as a mathematical shape. Consequently, as the size of a character is varied whilst printing, no information is lost and the result always looks smooth.

Dip switch – A method employed by several devices, including hard drives and printers, to enable the user to make manual adjustments to the way the device behaves. Printers typically have dip switches to control line feeds, perforation skips and the kind of fonts they will use.

DEVS – A directory on the Workbench disk containing the 'device drivers' for various Amiga peripherals such as printers.

Dithering – The juxtaposition of varying densities of black and white (or colour) dots to create the illusion of a grey scale (or more colours).

Printer driver – A program which sits between any applications program producing output and the printer. It converts any codes describing text and graphics format into a form suitable for the specific printer.

emulations, but (currently) not LaserJet IIP, III or IIIP.

But… cue fanfare… Hewlett-Packard has at last realised that many Amiga users own Hewlett-Packard printers, and I think you'll see Amiga preferences printer drivers for the complete DeskJet and LaserJet ranges before very long, and maybe even the PaintJets. Don't expect them to be free, however.

Canon's bubble jet printers are well supported with Amiga printer drivers. The BJ-10e, BJ-10ex, BJ-20, BJ-130, BJ-130e, BJ-300, BJ-330 and BJC-800 all have Amiga printer drivers available from Canon Technical Support (081-647 4044). Canon's LBP laser printers also have Amiga printer drivers.

The safest way to check if a printer works with the Amiga is to phone the manufacturer and ask.

Now printer memory. There are some types of printer which don't print out a page line-by-line, they create the whole page in memory first, and then print the whole thing out in one go. All laser printers work this way, and so do some inkjet and thermal printers.

To be able to create the whole page in memory, the printer obviously needs some memory. How much memory depends on the size of the page and the resolution at which it is being printed. The larger the page and the larger the resolution, the more printer memory is required. To print a page of A4 graphics at 300 dots per inch – which is a bitmap of 2,481 dots wide by 3,507 dots high – requires at least 1.5Mb of memory. If you were desktop publishing and wanted to download some fonts to be used on this page you would require further memory, hence the 2Mb minimum recommendation.

If the printer isn't a 'page printer' then it is the Amiga that stores the bitmap, and therefore the Amiga that requires the memory. But as the print-out is being sent to the printer a 'strip' at a time, after a strip has been printed the memory it has used can generally be overwritten by the next strip, meaning that sophisticated pages can be printed with comparatively little free memory.

Having said that, it does depend a lot on how the software that is doing the printing works. For serious applications work 1Mb is never enough, 3Mb is a much more comfortable amount of memory.

IT WON'T WORK

Is the Commodore MPS-1200 printer compatible with the Amiga 500 Plus? If so, where can I get a cable?

I've had the printer three years, having bought it with a C64, and as I have recently bought an A500 Plus and word processing software I would like to use the printer. I've been told that there is no such cable available, and even if there was it would be so slow as to be almost useless. Is this correct?

Phil Daniels
Deepcut, Surrey

Bad news, Phil. The MPS-1200 was built specially to work with the C64 and there's absolutely no way it can be connected to the Amiga because the MPS-1200 doesn't have a standard RS232 serial port.

LUCKY DIP

I have bought second-hand a Star LC24-10 printer without manual. Could you please print the configuration for the two banks of dip switches? And which is the best printer driver to use? Oh yes, and can this printer be converted to colour?

Alex Williamson
Falkirk, Scotland

Call Star Technical Support on 0494 471111. It will advise you about dip switches and colour kits, sell you a manual and send you printer drivers – you need one called Star24Plus.

The line gets quite busy at times so be prepared to hang on or take a chance that it will be less busy when you call back later.

PRINTER POSER

I must thank you for your reply to my letter given in the July issue. As a result of a note elsewhere in *Amiga Shopper* I got *Citizen Print Manager* and now my little Citizen 120-D is giving me excellent graphics for a 9-pin.

Now I have a serious problem with my Star LC24-10 printer. It has recently developed the habit of randomly going off-line and locking up in the course of printing text from word processors (*Scribble!* and *Wordworth 1.1*). When this happens it is immediately after a carriage return and the printer has to be switched off and on to re-initiate it. It self-tests and prints graphics OK.

Star couldn't offer any help so I sent the printer to a service firm, which cleaned and tested it with a PC and a BBC and said they could find nothing wrong with it. I tested it on a relative's Amiga with my own software, and it performed OK.

I suspected the cable and the Amiga, but they drive my Citizen 120-D and HP PaintJet perfectly in all respects with the same software and cable. I have tried another cable; same thing happens. Instead of the EpsonQ driver I have tried EpsonX and Star24Plus, with exactly the same results.

My A500 has been upgraded to Kickstart 1.3 and Workbench 1.3. It also has a BASEboard internal 4Mb (max) memory upgrade, although I am using only the self-booting 1.8Mb part of it.

Vic Trinder
Weymouth, Dorset

Hmm. The printer works fine on another Amiga and on the service company's BBC and PC, so it's not the printer; two other printers work with your Amiga and the same cable, so it's not your Amiga or cable. And the Star24Plus driver is the correct driver, the one Star will advise you to use, so it's not the driver.

Could well be an incompatibility between the printer driver and the BASEboard expansion memory. These 1.8Mb jobbies often cause weird little problems. Try removing it and see what happens. I know you say it all works fine on your relative's Amiga using the same hardware and software, but is your relative's Amiga Running Kickstart 1.3 and Workbench 1.3, and has it got a 1.8Mb BASEboard expansion in it?

BEG PARDON?

What is the expansion port in the Star LC-200 colour printer for? If it's for increasing the buffer size, which is what I think it's for, could you tell me how much it is and where to get the chip that fits in there?

Tim Price
Cwm, Gwent

This is a new one on me. The only thing on the LC-200 that could be mistaken for an expansion port is the little flap on top at the front that covers the dip switches. The LC-200 doesn't have font or RAM cartridge slots, none of Star's 9-pin printers do, only the 24-pin models.

WHICH ONE YOU GOT?

My Brother M-1009 printer produces a few extraneous characters at the top of each page, no matter what software is doing the printing. I'm using the EpsonX[CBM_MPS-1250] driver. What am I doing wrong?

Alf Denham
Portishead, Bristol

Brother made two versions of the M-1009, and Epson compatible version and an IBM compatible version. You can tell which version you have by looking at where the cable plugs into the printer. If there is just one port it's the IBM model, if there are two ports it's the Epson one.

The Epson model emulates the Epson RX-80 and should work fine with the EpsonX[CBM_MPS-1250] driver. The IBM model emulates the IBM Proprinter and should work with the CBM_MPS-1000 driver.

Dip switch settings could be very important. If the manual can't help you to set them correctly you'd better phone Brother Technical Support on 061-330 6531.

BETTER WP REQUIRED

I have struggled for months to get my Hewlett-Packard DeskJet printer to print anything other than conventional fonts (as supplied with Notepad and *The Works! Platinum*) in a standard size of six lpi.

I can get bold, underlined, and italic, but cannot change the font size. I particularly need to do this for letter headings.

G Wojniak
Aylesbury, Bucks

Sigh. I keep telling people this but either they don't believe me or they don't like what I tell them so they pretend not to hear. Nevertheless, here we go again. To be able to use the fonts and features built into *any* printer, the word processing software needs to be able to send control codes to the printer that instruct it to change fonts, change sizes, change its nappy, or whatever.

As far as text print-outs are concerned, the printer driver's job is simply to translate the codes sent by the word processing software into commands that the printer understands. So unless the word processor *specifically supports* the specific fonts and features of *a specific printer*, all it can do is send the standard codes for standard things like bold, italics and underline.

Once again, for clarity – it is the job of the word processor, as well as the printer driver, to support the fonts and features of a printer. It doesn't matter how fully the printer driver supports the printer for which it was written, if the word processing software is not able to (for example) send codes for 'change fonts' and 'change sizes', it cannot instruct the printer driver to pass this message on to the printer.

Notepad is a next to useless piece of software. Indeed Commodore decided not to distribute it with Workbench 2.04. And the word processing section of *The Works! Platinum* – which is the cheap (£29.95) *Scribble!* software – can only do the standard printer things like bold, italics and underline.

So the reason you cannot take advantage of your DeskJet's true power is because the software you are using is not good enough. Like it or not, that is a fact.

Wordworth 1.1 can drive the

DeskJet like a dream, so can *Protext 5.5*. These are currently the only two Amiga word processors that come anywhere near close to supporting the DeskJet properly, and both cost more than £100. As cold-blooded as it sounds, the only answer to your problem is to spend some money.

IT CAN'T DO IT



I have seen that *Citizen Print Manager* can vastly improve the output from a Citizen printer. I use *Pen Pal 1.4* a lot and would love to be able to use Print Manager with this to improve the appearance of fonts which are not built into the printer. Is this possible?

Colin Armstrong
Bowden, Melrose

The only thing which will improve *Pen Pal*'s output of 'Amiga Text' is if Softwood re-writes the program so that it works with Amiga screen fonts in the same way as *Wordworth* and *ProWrite*. No third-party program like *Citizen Print Manager* or *Turboprint Professional* will make the slightest difference, you'll still get jagged text. It's the way *Pen Pal* works.

For higher quality output of screen fonts you'll need to buy one of the aforementioned packages, or *Final Copy*, or a DTP program that supports high quality outline fonts like *PageSetter II*, *PageStream* or *Professional Page*.

UNDERWORKED DESKJET



I have bought a DeskJet for use with my 1Mb Amiga 1500. I am very impressed with its graphical output, design and speed. It has some nice resident fonts, my favourite being CGTimes, and I would like to use it instead of the default 10pt Courier. But the font cannot be controlled from the printer, only via software using 'Escape codes and the Hewlett-Packard Printer Control Language.'

After reading both manuals briskly I decided to boot *The Works! Platinum* and give it a try, but found myself getting nowhere. To add confusion to the issue I contacted Gordon Harwood Computers and Diamond Computers to ask about it, and they both replied that the Amiga does not have a driver to support the DeskJet printer. This seems strange as I have many drivers on software such as *Deluxe Paint II*, *The Works!*, Workbench 1.3, and various PD disks. Is there something wrong with this driver or don't the said retailers know of its existence?

James Stoddern
Camborne, Cornwall

I assume you have a DeskJet 500 as opposed to a plain DeskJet, which was the original model released some years ago now. What the retailers have told you is basically true, there is currently no Amiga printer driver available that completely properly supports the features of the DeskJet 500. The best there is at the moment can be found on Jamdisk 8 (from *Just Amiga Monthly* on 0895 274449).

But this driver will not solve all your problems, because as well as the printer driver supporting the features of the printer, so must the word processing software. Either directly, by providing menu options to change fonts, sizes and so on, or indirectly by giving you the power to send printer-specific escape codes directly to the printer, completely bypassing the printer driver.

The Works! Platinum cannot do this. It has a rudimentary feature whereby some standard ANSI style commands can be send to the printer driver, which interprets them and sends the appropriate escape codes to the printer, but the Amiga's ANSI style command set is sadly lacking in advanced features, it only really supports things like bold, italics, underline, line spacing, page sizes, tab positions and so on. You'll find a list of the ANSI style commands that the Amiga's printer device knows about in the back of your Amiga manual.

The answer is to buy a word processor that knows its printer's onions. For the DeskJet 500 the current choice is between *Wordworth 1.1* and *Protext 5.5*. If you are happy with *The Works! Platinum*, then I suggest that *Protext 5.5* will be more your cup of tea.

Ah, almost forgot to mention, the DeskJet you've got on various disks was written yonks ago for the original DeskJet. Things have moved on a bit since then, which is why it doesn't work with the DeskJet 500.

WOLF AT THE DOOR



Could you suggest a printer driver to use with my Olivetti DM124C, which has Epson LQ-2550 emulation? I am currently using EpsonQ, which is OK with text but not so good with graphics; all the colours are too dark and there is an occasional small gap within a graphic dump, possibly a tractor feed problem.

Steve Atkins
BFPO

Amiga printer driver writer extraordinaire Wolf Faust has just finished developing a BJC-800 driver for Canon, which is another printer that can emulate the Epson LQ-2550, and I suggest that this is the driver you require. But how to get it? Well, I know you are based in Germany, Steve, so send DM20 to Wolf at Am Dorfgarten 10, W-6000 Frankfurt 50, and I'm sure he'll forward you a copy.

COMPUGRAPHIC FONTS



I intend using Compugraphic (CG) fonts with *Wordworth 1.1* but have run into a difficulty. I do not possess a hard drive but would like to use these scalable fonts with *Wordworth*'s UltraPrint feature. The three fonts that came supplied with *Wordworth* (Byron, Blake and Coleridge) are of limited use, and scalable fonts provide great variety.

Would it be possible, for example, for me to use the PD Compugraphic type fonts that are now being advertised? It appears that these fonts have been converted to *Professional Page* and *PageStream* format; are they compatible with *Wordworth*?

Having installed Fountain on the Extras disk I am still experiencing difficulty with it, namely the Outline Font Source and Destination Font Drawer windows. I am but a mere beginner and would greatly appreciate an explanation of how you use this program.

Finally, what is the output quality of these CG fonts like compared to the internal fonts of, for example, a Canon bubble jet?

Kris Hunt
Croespenmaen, Gwent

Sure you can use CG fonts without a hard drive, but they are fairly big files so they can be cumbersome to handle on floppies and can take a little while to load. Fountain is able to understand the Compugraphic files that *Pro Page* uses, so it can convert these PD CG fonts to its own format. It will want (by default) to save the resultant files in the FONTS: and FONTS:_Bullet_Outlines directories (ie on your Workbench disk) and total file sizes can vary from 30K to 150K.

Fountain is quite simple to use. After running it press the Help button and follow the instructions. Source means the disk and directory from where the CG font is to be loaded, Destination means the disk and directory where the converted data will be saved.

Loading, scaling and printing any outline font takes time and memory, and Compugraphic fonts are no different. *Wordworth*'s output of CG fonts is excellent, very high quality, but whether it is worth the wait or not is arguable. There are more CG fonts than fonts built into any printer, but printer fonts are generally of (at least) equal quality and print thousands of times more quickly. (And I do not exaggerate).

Given an accelerator, a fast hard drive and lots of memory, Compugraphic fonts are wonderful things, but on a floppy-based, 1Mb Amiga 500 Plus they are a right pain in the wossname.

NO CONTEST



I noticed with great interest the article in issue 16 (page 11) about the 'cheap' Kodak Diconix 150 Plus printers for sale. I have been considering upgrading from my Nec P2+ and this opportunity seems most interesting. But first I need a little advice...

My primary printer use at the moment is printing small cake and pie labels for my family's bakery business. With the Nec in condensed mode I can squeeze 16 labels on to one A4 sheet. But the quality, even though it's a 24-pin printer, can be a bit scratchy.

Also there is the inherent problem with producing good quality graphical output and using Amiga screen fonts rather than the printer's own in-built fonts. Amiga screen fonts are printed as graphics, is there anything I can do to improve their output quality? The word processor I use is *Pan Pal*.

I have been thinking about the Canon BJ-10ex as a not-too-expensive high quality printer, but I haven't got around to getting any technical specs for any other printers. Can you give me a quick opinion of what I should be looking for? How do the Kodak and the Canon shoulder up to each other?

Ian Deaville
via the Sunbury BP Research Centre fax machine

Given a choice between the new technology Canon BJ-10ex, which has a good Amiga printer driver, and the old technology Kodak Diconix 150, for which there is no proper Amiga printer driver (only a hacked EpsonX driver), there is no choice: the BJ-10ex is light years better. It's not the fastest printer in the world, but you can't have speed *and* quality at that price. The BJ-10ex will do all you want it to do, and more.

Your problem is the word processor. Output quality from *Pen Pal* of Amiga screen fonts is bad, as you know. There's nothing to be done, except to buy a better word processor. I promise you that the best quality printer in the world would not give better quality screen font output from *Pen Pal*. The program cannot do any better. I suggest that *Wordworth 1.1* will be right up your street, giving you quality and flexibility. It even comes with the correct printer driver for the BJ-10ex.

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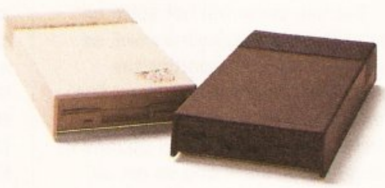
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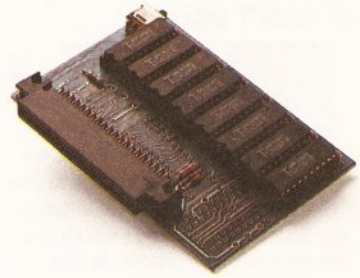
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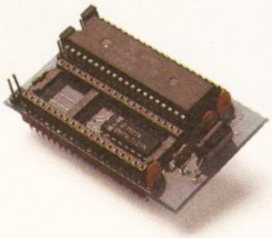
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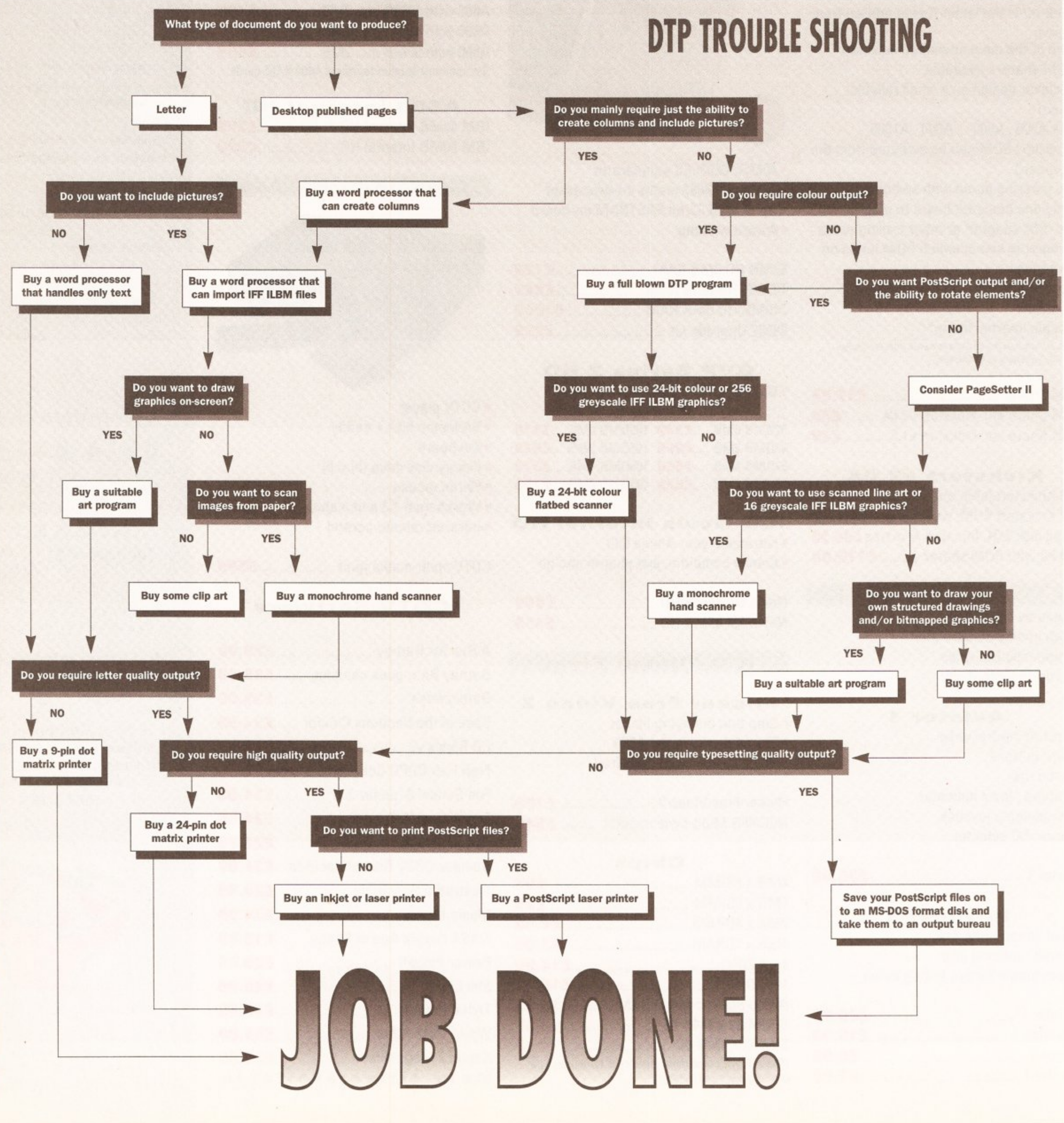
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DTP...

From fonts to file transfers and colours to greyscales, Jeff Walker gives the answers to desktop publishing without tears...



DIFFERENT STANDARDS

I have upgraded to an Amiga 1500 Plus with GVP hard drive and 5Mb of memory. I own version 1.1 of *PageSetter II*.

The only outline font that comes with *PageSetter II* is CGTimes, so I would like to use the LetterGothic and CGTriumvirate outline fonts supplied with Workbench 2.04 as they give superior output to bitmapped fonts.

However I am having trouble installing these as *PageSetter II* does not seem to recognise them. The file formats seem different. Can you help?

Edward Campton
Scraptoft, Leicester

Like most so-called standards, AGFA's Compugraphic standard has a few variations.

The standard that *PageSetter II* adopts requires three files to be present in your CGFonts: directory – "fontname.atc" (the encoding table), "fontname.metric" (the spacing information) and "fontname.lib" (the font definition). Funnily enough, the font definition file would appear to have the encoding table and spacing information in it, it's just that *PageSetter II* prefers them to be in separate files.

The standard that Workbench 2.04 uses has just the one file, "fontname.type" in the "FONTS:_Bullet_Outlines" directory, which is exactly the same format as as the "fontname.lib" files that *PageSetter II* uses. The difference is that Workbench would appear to be extracting the encoding table and spacing information from this one file.

(There are several other files Workbench 2.04 requires for Compugraphic fonts – "FONTS:fontname.font", "FONTS:fontname.otag", "FONTS:_Bullet/plugin.types", "FONTS:_Bullet/if.fnt", and "FONTS:_Bullet/if.ss". When and if I ever find out exactly what these files do, you'll be the first to know. All I can tell you at the moment is that the "plugin.types" file is exactly the same as the "PlugIn.TypeBucket" file that *PageStream* uses, and that it appears to contain one lot of encoding and spacing information plus the definitions of five typefaces. I'm sorry about all the vagueness but the exact ins and outs of the Compugraphic format are available only by buying a license from AGFA for a large amount of money, and even if I did cough up the cash I wouldn't be allowed to tell you the details. If, on the other hand, I can work it out for myself...)

So to be able to use *PageSetter II* with the Compugraphic fonts supplied with Workbench 2.04 you would need to be able to generate a "fontname.lib", "fontname.atc" and "fontname.metric" file from the Workbench "fontname.type" file. Theoretically speaking, that is, because there isn't currently a program that can do this, so I can't check it out.

For more Compugraphic typefaces that can be used with *PageSetter II* you should consider buying the Outline Fonts Pack (the 'classic 35' Adobe typefaces) or contact George Thompson Services (0707 664654) or EM Computergraphic (0255 431389) and ask for details of their cheaper shareware and PD Compugraphic typefaces.

POETRY IN (NO) MOTION

I occasionally require high quality colour output from *Wordworth 1.1* Rev 6. How much would it cost per page for A4 black-and-white text, colour text, and full colour graphics?

Would a DOS transfer program maintain typeface size, colour and pictures if a document created by *Wordworth* was saved to disk as a PostScript file?

John Arcus
Bury, Lancs

Um. We have a problem straight away here because *Wordworth* wasn't designed to create colour PostScript files, only monochrome ones. This means that any colour in your *Wordworth*-created PostScript documents will get turned into shades of grey.

To create colour separations, or colour PostScript files for printing on colour PostScript printers, you'll need a more sophisticated program; I notice you don't have a hard drive, so it'll have to be *PageStream* because *Professional Page* requires a hard drive these days.

As for prices, well the best way to find out is to approach a few DTP bureaux and ask.

Speaking in general terms, for Linotronic output you will have to pay for the time it takes the imagesetter to produce your films – about £15 per separation, but it could be more or less, and you need four separations for each colour page (for the cyan, magenta, yellow and black parts of each page), or just the one for monochrome. Then there'll be the cost of making the plates (one for each separation), and the cost of reproduction, which will depend on how many you want reproduced and what kind of paper you want to print on to.

High quality, full colour output is expensive. Certainly prohibitively expensive unless the output is going to be reproduced in fairly large volume. If you want just a few colour pages, forget it.

High quality monochrome output is not so expensive. You should be able to get a couple of thousand double-sided, monochrome A4 leaflets printed for under £100 almost anywhere.

Phone around to find out the best prices. And don't forget that the firm that is doing your imagesetter output doesn't have to do the reproduction as well. Films in hand, you can take them to any printing firm to be made into plates and reproduced if it works out cheaper that way.

If you want to pick certain parts of your document out in one or two solid colours – a technique known as 'spot' colour – this needn't cost the earth. An extra film will have to be produced containing just those parts of the page that are to be printed in each colour, but this will add only about £50 (tops) to the cost of your print run.

Many DTP bureaux will own a colour 300 dpi PostScript printer and will be able to print full colour 'one-offs' on this quite reasonably. But colour PostScript output may not be what you are after, if you've never seen such output it's probably nowhere near as good as you are expecting it to be. Ask to see a sample before committing yourself.

As for transferring PostScript files on to MS-DOS disks, PostScript is PostScript, the whole beauty of it is that it doesn't matter which computer produced the PostScript file, any computer will be able to print it on any PostScript device, provided it is in a format that your particular computer can read – which basically boils down to the file being on an MS-DOS disk or Macintosh disk, although a few bureaux will accept Amiga disks.

CONFUSING MOVING

***Protext* is a marvellous word processor, but I get so confused copying blocks of text between several documents, especially when I happen to have a block marked in more than one document.**

I regularly work with between 5 and 15 documents open at once, and yet I still haven't managed to master the technique using the keyboard; I'm forever moving or copying the wrong block into the wrong document, even when I'm sure that this time I've got it right. There must be an easier way. Hmm?

Spencer George
Preston

Yeah, makes your hair fall out sometimes, doesn't it?

Tell you what I do, I use the Split Screen option (Ctrl-Shift-X) and make sure I have the document I'm copying *to* visible in the upper window and the document I'm copying *from* visible in the lower window. Then I click in the *from* window, mark my block, click in the *to* window, move the cursor to where I want the block to be inserted, then press Ctrl-O to copy it. Another Ctrl-Shift-X unsplits the window, and off I go again.

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Compugraphic fonts – Rather than a simple bit-mapped image of each character which grows more jagged with magnification, a Compugraphic font has each of its characters represented as a mathematical shape. Consequently, as the magnitude of the character is varied in printing no information is lost and the result always looks smooth.

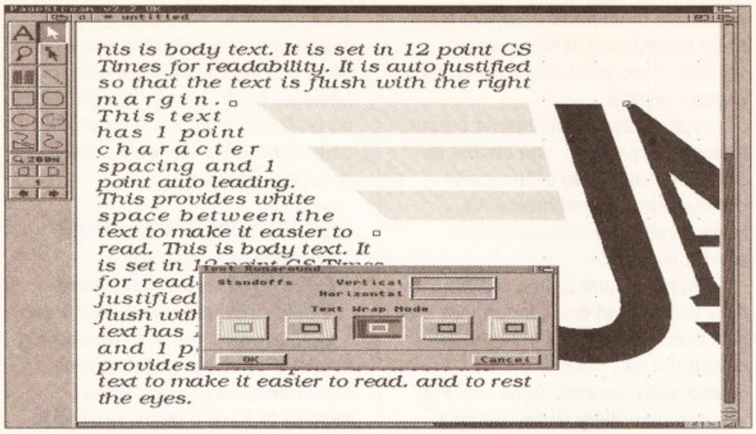
Font – The group of letters, numbers and special characters that comprise one variation of typeface, eg: 12pt Times, 12pt Times Bold, 12pt Times Italic.

PostScript – A powerful mathematical language used to describe graphics and text images to compatible printers. Because it does not rely on a pixel system, objects can be scaled and rotated without distortion or loss of detail.

Printer driver – A program that sits between any applications program producing output and the printer. It converts codes describing text and graphics formats into a form suitable for a specific printer.

Typeface – All sizes of a particular type family and style, eg: Times Italic, Helvetica Italic, Courier Bold.

Type family – All variations and sizes of a typeface, eg: Times, Helvetica, Bookman.



With *PageStream*, it's easy to run text around pictures or drawings. Just select the Text Runaround option from the Object menu

COLOUR COMPOSITES

I print in colour on my DeskJet 500 using the colour separation mode in *PageStream* and passing the paper through the printer four times using four different coloured ink cartridges.

I have read that the same thing can be done in *Professional Page*, which I own also, but it seems you have to use the PostScript Output requester to do separations, and I can't print PostScript to my DeskJet 500. Is there a way around this?

Also, how do I run text around structured drawings in *PageStream*. I seem to get a "box looking text" every time, like you do when you use a bitmap graphic.

RS Jeffery
Castle Donington, Derby

Professional Page wasn't designed to print colour separations to non-PostScript printers. The only way around it would be to use a software PostScript interpreter like *SaxonScript Professional* to print them. Or use *PageStream*, of course.

To run text around the contours of structured drawings in *PageStream*, click on the object and then select the Text Runaround option from the Object menu (or LeftAmiga-T) and choose the type of runaround you want.

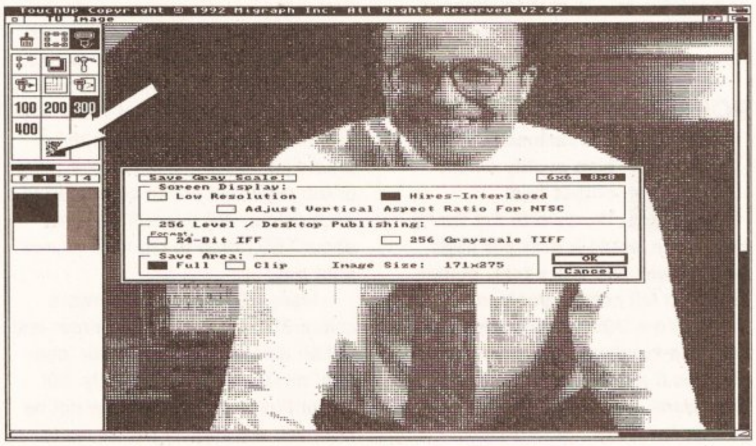
There's a screenshot somewhere around here which shows you what this requester looks like. Baffles me why you can't do this, there are easy-to-follow, step-by-step instructions on page 4.27 of the *PageStream* manual.

ROTTEN SCANS

I have a Golden Image hand scanner. It's working OK if I scan black-and-white line art images for DTP work, but for scanning photographs it's not working too well.

It seems that the *Touch-Up* scanning software has only four shades of grey, so my pictures are rotten. How can I get more shades of grey? Is there any other scanning software I can use perhaps?

Marcel Dopheide
Soest, Holland



The arrow points to *Touch-Up*'s Save as Greyscale button. Easy – when you know where to find it!

If you have an early version of *Touch-Up*, version 1.1 or something like that, it doesn't have a 'View Greyscale' option, but it can save the scan as a 16 greyscale IFF. Click the 'Save As Greyscale' button and a requester will appear. Depending on what version of *Touch-Up* you have it may look like the one in the screenshot (which you can see directly above) or it may be something simpler.

After saving the greyscale you'll need to load it into an art package to see it in all its glory.

Although the scanning heads that come with Amiga hand scanners are all the same these days, *Touch-Up* is the only scanning software which works with the Golden Image hand scanner and interface. If you want different software it means buying another interface as well. Power Computing in the UK will sell you the Power Scanner interface and software separately from the scanning head (this software is much better for greyscales) but it might work out cheaper for you to buy the whole Power Scanner package in Holland.

NAUGHTY NAUGHTY

I have *ProWrite 2.5*. When printing for the first time after running, it prints fine, but subsequent prints crash the machine.

Some people have told me that I do not have enough memory. Is that right?

I have an Amiga 500 (not a Plus) with a 512K trap door expansion and Kickstart and Workbench 2.x.

Avail tells me that I have 407,360 total memory, 365,870 bytes of which is chip memory. I don't know which Agnus chip or PCB revision I have either.

Chris Whitworth
Sunningdale, Berks

Sounds to me like you have an old 512K Chip RAM machine and you are running a disk-based version of the new Kickstart ROM, probably one of those 'beta-test' versions that a number of disreputable PD libraries were selling before the real thing was released. I'm not surprised *ProWrite* is crashing. Lots of other stuff will probably crash as well. Write again when you've upgraded properly.

PHOTOS & BENT WORDS

Which is the best DTP system for using with 16 greyscale scanned photographs, and is there a DTP program that can bend text in the same way that *Deluxe Paint* can?

Patrick Taylor
Selston, Notts

Hmm, you could have expressed your first question more precisely. What do you mean by 'best'?

All the Amiga DTP programs (including *PageSetter II*) can import, re-scale and print 16 greyscale IFF ILBM graphics. *Professional Page* can rotate them as well, *PageStream* and *Saxon Publisher* can twist and slant as well as rotate.

Without a hard drive the only sensible options are *PageSetter II* and *PageStream*.

If you are talking about the quality of printed output, this mainly depends on the output resolution of your printer, although *PageStream*'s bitmap graphics output leaves a lot to be desired.

So we've arrived at an answer: The best DTP system for using with 16 greyscale scanned photographs if you don't have a hard drive is *PageSetter II*. If you do have a hard drive the answer is *Saxon Publisher*, remembering that we are talking solely about working with 16 greyscale IFF ILBM graphics.

For bending text (and implementing many other effects) you need a structured drawing package. *Professional Draw 3* can create 'clips' that *PageSetter II* can import, so this would seem the obvious one to go for, but you might also like to consider *Expert Draw* (reviewed in issue 14), which is a bit cheaper and perhaps a tad easier to learn how to use, although it doesn't have as many features.

NOW YOU SEE IT...

Last week I carried out the modification to my Amiga 500 to increase the Chip RAM to 1Mb. I have a 2Mb Spirit Xram expansion, and Avail now tells me that I have 3,137,272 bytes total memory, 1,040,152 bytes of which is Chip RAM. All went nicely until I tried to use *PageStream 2.2*, when I soon found out that something is not kosher.

Loading the Times typeface to its maximum listed size and then applying the Outline style and re-sizing to a larger size – as I have done many times before – I was rather startled to see a band about two inches deep at the top of the screen which looked like the horizontal hold had gone wacky.

When I tried to print it, the printer started up, printed the first letter of three and then drew garbage until I switched it off.

After a few more attempts I discovered that provided I didn't re-size the font on the screen, all went well. Over to you, Jeff.

J Joyner
Lytham
Lancs

Eeek! To get 1Mb of Chip RAM after the modifications have been made you need a 512K RAM expansion in the trap door, one of the four-chip versions rather than the old 16-chip jobbies (like the Commodore one).

Although Avail thinks you've got 1Mb of Chip RAM (because that's what the motherboard is telling it),

there's only 512K of it actually there. The 2Mb in the Spirit Xram is all fast memory.

PRO PAGE BUG?

I have a Power Scanner (version 2.0) that I use to make up presentations with *Professional Page 1.31*. The scans are taken from an engineering drawing which is 340mm long.

The files created can be loaded into *Professional Page* without problem, but if I use the *PowerScan* software to rotate the scan by 90 degrees, so that it can be imported into *Professional Page* and presented across a page, the file will not load – "Error while reading file" is displayed.

The file seems to be OK as it can be loaded into *Deluxe Paint*.

If this same scan is converted to grey and rotated by 90 degrees, it will then load into *Professional Page* but the print-out is naff.

MJ Fuller
Darras Hall, Ponteland

It's a bug in *Professional Page 1.31*'s IFF import routine. If I remember correctly (and it was over two years ago now) I solved a similar problem by loading the graphic into *Deluxe Paint* and then re-saving it from within *Deluxe Paint*, after which the graphic imported into *Professional Page* OK.

You really ought to consider upgrading to version 3.0, it's light years better (and faster) than 1.31.

I WANT A ' PLEASE

How do I get *Protext 5.5* to display a reverse apostrophe on-screen at the press of a key? At the moment every time I want to use it I have to select it by mouse from the Text/ Choose Character requester, which is a real pain in the backside. I can't find it anywhere on the keyboard.

William Stevens
Twickenham, Middx

This can be rectified by *Protext*'s configuration program. Run Config and select Main Configuration Menu, and from there select Keyboard Options. Now select the bottom option in that requester, Redefine Keyboard Layout.

You will be asked to press the key you want to redefine. For the sake of this example press the apostrophe key (to the left of the number 1); we are going to redefine Shift-apostrophe so that it displays a reverse apostrophe instead of the tilde character.

A slightly daunting display appears showing what will happen when that key is pressed in conjunction with various other keys, like Shift and Ctrl for example. The prompt is asking us to press the E key to edit the definition. So press it.

Another little display appears. Press the right-arrow key once so that the position underneath S (for Shift) is highlighted, and press Return. Now we can enter the ASCII value of the character we want *Protext* to display when we press Shift-apostrophe. The ASCII value for the reverse apostrophe is 96, so type this into the gadget and press Return again.

That's it. Done. Press the Esc key four times to get back to the front menu panel, then Save the new configuration (accept the default filename) and Quit.

Next time you run *Protext*, Shift-apostrophe will cause a reverse apostrophe to be displayed on the screen, and when the document is printed a reverse apostrophe, or your printer's idea of a reverse apostrophe will be printed.

TRACE TRACKED DOWN

I need to convert bitmap clip art into structured drawings so that I can re-size them at will without introducing jagged edges. I understand there is a small utility called Trace that does this. Where can I get hold of this program, or something similar.

Graham Sparke
Whitchurch, Wales

The Trace program is part of the *Professional Draw* package and cannot be bought separately. The version distributed with *Professional Draw 3.0* is considerably better than previous versions.

You should understand that even a small and fairly simple piece of two-colour bitmapped line art can turn into a large, memory munching structured drawing after being traced.

WHERE ARE THE CG FONTS?

I recently upgraded to Workbench 2.04 and tried to use the scalable fonts with Wordworth 1.1 Revision 6, but when I select Typeface-Other from the Format menu, *Wordworth* ignores the scalable type fonts.

I've checked that the fonts are actually on my hard disk, I've run the Fixfonts program, and I've tried again, but I can't get it to work.

What am I doing wrong. *Wordworth* does support scalable fonts, doesn't it?

Chris Myers
Middleton, Leeds

On the Fonts disk that came with Workbench 2.04 you'll find a file called diskfont.library in the LIBS directory. This is the version of diskfont.library that supports scalable fonts, and you needs to copy it to your DEVS: directory, overwriting the much smaller file of the same name that is already there.

Then re-boot the machine, run Wordworth again and you'll find that you will now be able use the CGTimes, CGTriumvirate and LetterGothic scalable typefaces.

SHOPPING LIST

I own an CDL A1500 with a 100Mb Quantam hard disk drive partitioned into two 50Mb sections name QDH0 and QDH1, I have Workbench 1.3.2 on QDH0 and Workbench 2.1 on QDH1. My machine was bought about two years ago. I have all of the latest Amiga 500 Plus chips on-board apart from the 2Mb Agnus, and I have 1Mb of Fast RAM and 1Mb of Chip RAM. (I have had my board altered to allow me to use the 1Mb of Chip RAM.) I also have a Cumana CAX 354 3.5in second disk drive mounted in my CDL case. I am using a Citizen 224 colour printer and the *Citizen Print Manager* driver.

I wish to purchase the following items for my computer and was wondering if you could guide me toward the best programs.

1. A hand held scanner. I am interested in the Power Scanner as it is reasonably priced and seems to be quite popular. Is this a good buy or is there something better around in the same price range?

2. A word processor with graphics. I am considering *Pen Pal* but, with the arrival of *Final Copy* I am not sure which of the two would be the best.

3. A desktop publishing package. I will only need to use black and white so I was wondering if *PageSetter II* would be suitable for my purposes, or would *Professional Page* be more what I am looking for?

4. An inkjet printer. I would be using it mainly for printing out DTP work and scanned images. Would the Commodore 1270A be OK for this or would my Citizen 224 give better results?

5. A RAM expansion. I can place another 1Mb in my hard drive, giving me 3Mb total memory. Would this be enough for *PageSetter II* or would I have to buy an external RAM expansion with a throughport? How much memory would you recommend?

Matthew Boyden
Werrington, Peterborough

You're using Workbench 2.1? But it hasn't been released yet. So any copy you may have (illegally) picked up from anywhere will be a beta-test version and bound to cause problems, problems that we at *Amiga Shopper* won't be able to help you with until the finished item is released. You'll be better off with Workbench 2.04 until 2.1 is released properly.

I can answer questions 1 to 3 quickly. In my hand scanner round-up the Power Scanner came out top; in my DTP roundup *Professional Page* came out top; if you are going to buy a DTP program there's no need to buy a word processor that supports graphics, but Mark Smiddy's recent review of *Final Copy* said that it was better than *Wordworth*, and in my roundup of word processors I said that *Wordworth* was better than *Pen Pal*. It follows that between us we reckon that *Final Copy* is better than *Pen Pal*.

If you are going to buy an inkjet printer the low-end choice is between the Canon BJ-10ex (or clone) and the DeskJet 500 (or clone).

And for what feels like the three-millionth time this year: desktop publishing requires as much memory as you can afford. There is no "this will do" figure, but 2Mb is the absolute minimum, which means the program will run but you won't be able to do an awful lot with it. For creating documents of more than a single page, a more realistic minimum is 6Mb.

BARK UP WRONG TREE

I have a copy of *Pen Pal*, a superb word processor which is more than adequate for my requirements. But it does not say in any of the documentation how to save an altered graphic that has been imported and edited within the program.

I have several clip art disks containing dozens of pages of IFF graphics, and after importing a page and then cropping the required picture for use I find if I try to save it, it will save as "filename.WTR" but will not reload, the program saying "IFF file not found". How do I crop a clip art page and save the required picture as an IFF file that *Pen Pal* will recognise?

Brian Doolan
Castlehill, Scotland

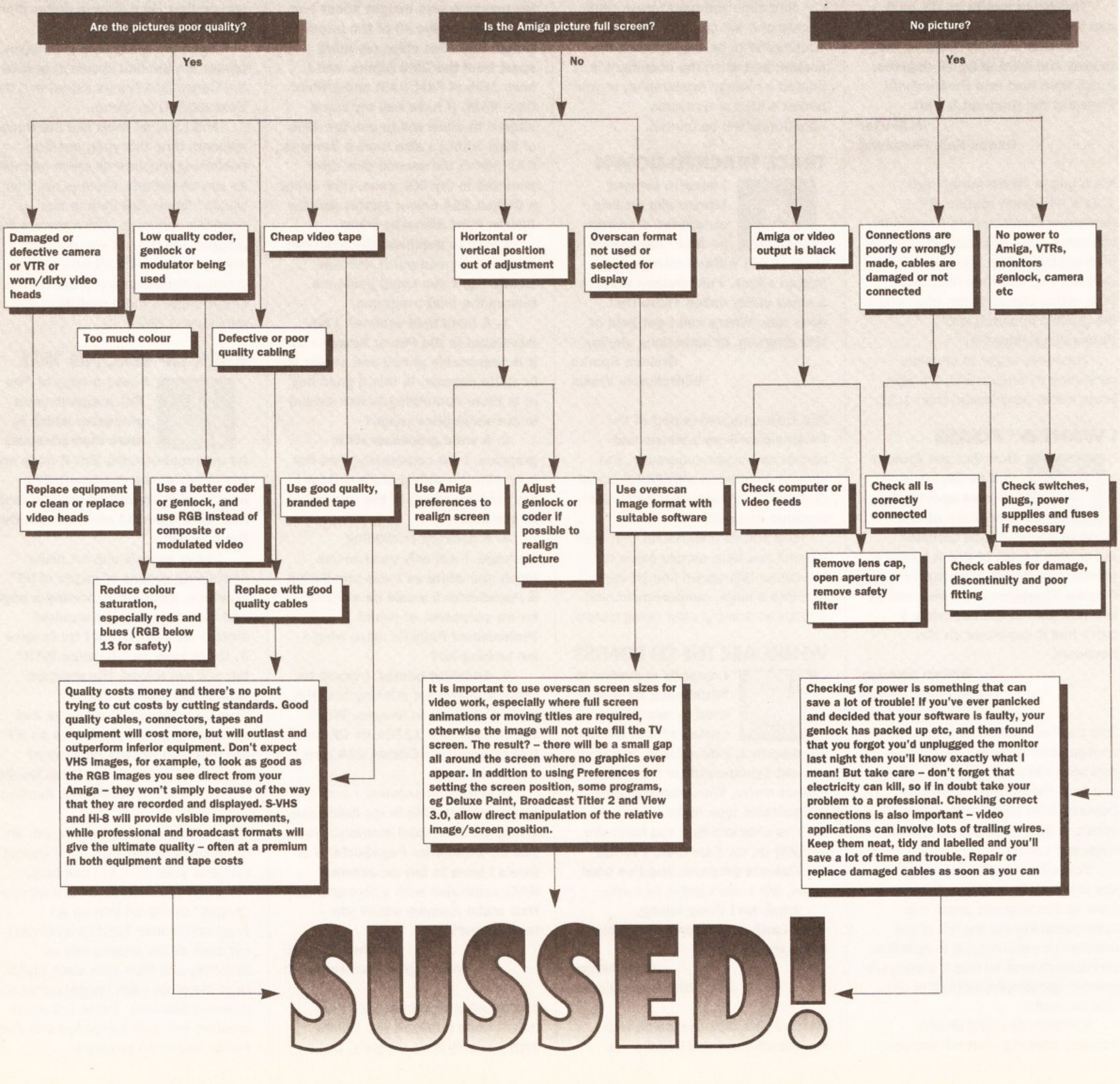
Pen Pal is a word processor, not an art or painting program, so it cannot edit and save IFF ILBM graphics.

What you need to do is load your "pages" of clip art into an art program (*Deluxe Paint* for example), cut each of the images out as brushes, and then save each brush (and therefore each image) under a different filename. These individual brushes can then be loaded into *Pen Pal* as and when required.

VIDEO...

Jinxed by genlocks, flummoxed by flicker or dumbfounded by digitisers? Worry no more with Gary Whiteley's video solutions...

VIDEO PROBLEM KILLER



BETTER QUALITY

A **I have an Amiga 500 and I use a modulator to connect it to the aerial socket of my TV set so that I can see what I'm doing. I thought I was getting on OK until yesterday when I saw my friend's new Amiga set-up. The quality of his video output is much better than mine. Why?**

Keith Wilson
Daventry

Well Keith, my guess is that your friend has his computer connected to an RGB monitor, which makes a world of difference to the output quality. In simple terms, the reason for this is that the Amiga can output RGB directly and by connecting straight to an RGB monitor a superior picture will be obtained. One of the main technical reasons for this is that colour monitors and TVs all use RGB to produce their pictures by exciting a matrix of red, green and blue phosphor dots (which are printed on the face of the video tube) with electrons. The result is the production of coloured light in proportion to the RGB feed, thus reproducing the original picture on the screen.

Now, you might be wondering why your TV doesn't look as good as your friend's monitor, even though it produces the picture in an identical way. Time for some more technical stuff...

In order to transmit pictures from a studio camera or VTR to your television they are first converted from their original RGB format (colour TV cameras are like reversed TV tubes, producing electrical signals as light falls on RGB sensors) into something which can be more easily transmitted, includes simultaneous sound, and can be understood by your TV. The result is an RF (Radio Frequency) signal which is picked up by your aerial and decoded again by your TV set into sound and RGB, which results in what you hear and see. However, because the initial coding reduces the quality by compromising the signal somewhat – and then the subsequent decoding reduces it even more – the resulting quality is visibly inferior to the original RGB signal. Of course, the results depend largely upon the quality of the coder/decoder equipment and it can be safely assumed that a broadcast transmitter will give results superior to a computer modulator costing a few pounds. Since the full scale of a video signal is only 1 volt, and it is also being electronically coded and decoded, this degradation is hardly surprising!

By analogy with the television transmission system, the Amiga produces the RGB signals and the modulator converts them to a form which your TV set can tune into via the aerial socket, hence coding and decoding them to produce the output you see on your TV – and degrading the quality in the process. By cutting out the conversion stages and using the RGB signals a much better picture is produced.

Marked improvements over using the aerial socket with the modulator can be made by using the composite video output from the modulator instead – if you have a monitor which can accept it – but for the best quality (short of buying a multisync monitor and flicker fixer) you should really purchase a proper RGB monitor to get the full benefits of the Amiga's RGB output. A wide range of monitors are available – from Commodore, Philips and others, as well as SCART (EuroConnector) equipped TV/monitors.

VIDI FILE CRUSHER

I use the Rombo Vidi-Amiga to grab frames in black and white from my video recorder. As these files are over 41,000 bytes each I was wondering if there is any way of crunching them so that I can get more than 20 on a disk? I've tried various packages and they all fail, reporting 'No Hunk Available' – whatever this means.

Sometimes, to clean up a picture I load it into *Deluxe Paint III*, and it saves at around 35,000 bytes, but takes about four times longer to reload into the Vidi program. Only by resaving the picture via the Vidi program is it restored to its original length and loading time of six seconds.

Is there any way of producing a *DPaint* file which is directly comparable with Vidi-Amiga?

D Halliday
Wantage
Oxfordshire

Well, with regard to crunching the image files, I tried *LHARC* and *LHA*, which are both shareware, and I had no trouble obtaining files of around 19K with either program on some original Rombo demo images. But of course you'll have to decrunch the files again first before you can use them, though if it's simply disk space you're trying to optimise then these programs should do you proud – though other picture files, in particular HAM, will hardly crunch at all, so watch how you go. I also understand that Nico Francois' *Power Packer* program can crunch pictures now, and decrunch them on the fly, but I can't swear to this as I've not used it. I think this might only apply to the commercial version though.

Another idea you could try would be to make an animation in *DPaint III* using your various images. As you load each image in after the first one, remap its palette so that all the pictures have identical colour palettes – which won't cause any problems if all your pics are B&W and in the same resolution. Use the About requester to show how big the animation is becoming and save it to disk before it is too large to fit. I reckon you should easily get 20 lo-res B&W pictures on a disk this way, since they take up less space compressed together into an animation than they would have done individually. The drawback in this case is that you'll have to load the entire animation in order to extract a single frame.

I did some investigating into the various picture formats and I think that the difference is that the *DPaint III* file is in a compressed IFF format, whereas the Rombo file is uncompressed. This certainly makes sense in terms of file sizes, and I imagine that the Rombo software has to uncompress the file before it can display it, hence the mega slow-down. The uncompressed file storage that Vidi uses would also help to explain the rapid rates which can be achieved with lo-res sequence playback.

If you want to use your retouched files with Vidi there appears to be no way other than the slow method which you've already discovered.

DEAD DIGI-VIEW?

Although I have just recently bought the Rombo Complete Colour Solution, I also have an old NewTek *Digi-View*, which has been upgraded to version 4 Gold. The problem I have is that although the *Digi-View* worked a treat on my version 1.2 and 1.3 DOS A500s (and still does) it just doesn't want to know on my Amiga 500 Plus.

To make doubly sure I tried it on a friend's A500 Plus and it won't run on that either, not even the demo. Is this a hardware problem peculiar to the 'Plus' and is an upgrade available which is 'Plus' compatible? By the way, in *Amiga Shopper* 14 Paul Broadbent of Scunthorpe was wanting to add a digitiser to his Amiga but didn't want the plugging/unplugging headache caused by using the parallel port. Did you know that Rombo does an adaptor for its digitiser which plugs into the expansion slot of an A500? The only thing is – it costs around £60!

Mike Tankard
Worsley
Manchester

continued on page 36

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Crunch – A method of compacting programs and data so that less storage space is used on a disk. When a crunched program is loaded into memory it automatically de-crunches itself into its full, functioning size.

ECS – Enhanced Chip Set is the name given to the new versions of the Amiga's custom chips that handle graphics and sound.

Flicker fixer – A device that removes the flicker from the Amiga's interlace mode and the visible scan lines from the non-interlace mode.

Genlock – A way of slaving one video source (eg Amiga) to another (eg video tape) in order to synchronise their signals to allow stable wipes, mixes and other effects including overlay between the two sources.

HAM – Hold And Modify is an Amiga graphics mode that allows all 4096 colours to be displayed at once, with certain restrictions.

IFF – Interchange File Format is a means by which data from different graphics or sound programs are saved in a compatible way. It enables data to be exchanged between programs very easily.

Interlace – The method of displaying a TV picture where two screens of 312.5 lines each (or 1 field) are shown rapidly one after the other to give the impression of a single image, or frame, of 625 lines. A field lasts 1/50th second, a frame 1/25th, hence video is said to run at 25 frames per second.

RGB – Red Green Blue is a standard for video signals that provides better quality than composite or Radio Frequency signals.

VGA – Video Graphics Array is a high resolution graphics system for the IBM PC, with up to 256 colours and a maximum resolution of 1024x768.

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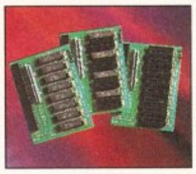
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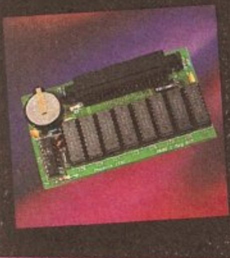
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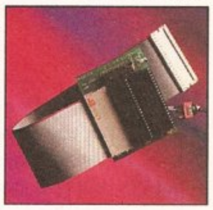
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continued from page 33

Thanks for the extra Rombo info, Mike, let's hope it's of use to a few people out there.

Sorry to hear about the *Digi-View* trouble. Check the version number you are using with the "About" requester in the menu bar. If you have a version prior to version 4.02 you'll need to upgrade, as the older versions can't handle the extra requirements of WB2.04 correctly. I have 4.02 and it works just as well on my WB2.04 equipped Amiga 2000 as it did before I upgraded from 1.3. So now you know what the problem is – old software!.

Try your original dealer, or a NewTek distributor such as HB Marketing (☎ 0753 686000) or Silica Systems (☎ 081 309 1111). Failing that, write to NewTek at 215 S.E. Eighth Street, Topeka, KS 66603 USA, fax (0101 for USA) 354 1584.

ENLIGHTENMENT NEEDED

I have a Commodore A2300 genlock fitted internally to my Amiga 1500. When my Philips monitor is connected to the Amiga's RGB connector the output is a lot brighter than when it is connected to the RGB on the genlock. Is there a pot I can 'tweak' on the genlock to brighten up the video output, or will I just have to live with it?

JA Thompson
Worthing
West Sussex

This is apparently one of those things that you'll just have to live with. There are ways of sorting it out, but I'm told that more than a simple tweak is involved – like modifying some of the electronics. Why not try to persuade Commodore that you'd like a genlock which works better than the one you currently have?

CROSS-EYED

I have a plain Amiga 500 running DOS 1.2, 1Mb of memory and a Philips 80 monitor, all about three years old. I use the Amiga largely for word-processing and my problem is eye strain. Is it possible to get a VGA screen or better for an A500? Would the latest ECS Denise chip reduce the flicker, and if so what else would I need to change?

Andro Linklater
Camden
London

The only way to get a 'VGA' screen, as you put it, is to use a deinterlacing device such as ICD's Flicker Free Video, which fits inside your A500, and to use a suitable multisync monitor which is capable of running at line frequencies which include 31.2 kHz. You'll still need a multisync to use ECS Denise's Productivity mode, so, not much difference there.

There are some cheaper, DIY methods which you could also try. While they don't exactly replace the deinterlacing method, they may turn out to be useful and save you several hundred pounds.

- **Method 1:** Fiddle with the colours of your Amiga screen by using Preferences and/or the settings of your word processing software. Choose a combination which reduces the apparent flicker.
- **Method 2:** Run your Amiga at 60Hz frequency (the NTSC mode). There are a number of programs such as Hertz, 60Hz, and PowerUtil which will let you do this. While this method will certainly knock out the flicker, you may well have problems with some programs not being accessible beyond the bottom of the screen limit.
- **Method 3:** If your word processor allows it, switch to a non-interlaced screen. Although everything on the screen will be doubled in size, it should no longer flicker as badly.
- **Method 4:** Turn the brightness right up and wear sunglasses (at least that's what someone on CIX suggested recently!)
- **Method 5:** Combinations of Methods 1 to 4.

WHAT PICTURE FORMAT?

I'm quite new to Amiga graphics, but I've been doing wedding videos for a couple of years. I purchased an Amiga 500 Plus so that I could add titles and other graphics to my productions. But I'm confused about what size of pictures I should be using with my VHS video set-up. I use *Deluxe Paint III* as my main program. My question is – what is the best image size to use when working with video, bearing in mind the need to use an interlaced format?

T Douglas
Airdrie
Strathclyde

Yes, the whole thing about Amiga graphics and television is that you have so many combinations of size and colour that I'm not surprised you are confused. When I started off with my Amiga 1000 in 1986 I was informed that I had to use an interlaced screen format because a television picture is interlaced.

But the truth is that any format of Amiga image *can* be used, from two colour low resolution to 4096 colour HAM interlaced. The problem is that graphics recorded in non-interlace formats will cause marked instability during editing or genlocking because they are insufficiently synchronised, though for playback purposes they should normally work fine.

My favourite standard Amiga mode has usually been 16 colour high resolution, certainly where titles, general graphics and 2D animations are concerned. Admittedly this doesn't sound like a lot of colours, but careful choice and canny dithering can work wonders.

For 3D animation I will often use HAM interlaced format, simply because it provides a fairly realistic picture which can be played back directly from the computer.

Regarding size, with video it is best to use an overscan screen, which with *Deluxe Paint III* might be something like 352 x 580 in interlace format. This is simply because the image will then reach beyond the edges of the visible area of the TV screen, ensuring that any animations or pictures will fill the screen correctly.

Non-overscan images, eg 320 x 512 interlace, will exhibit a small gap all around when shown on a TV screen, which is OK if there is no movement and the background is all one colour, but which would otherwise be unacceptable.

Lastly, a short word about that old chestnut – memory. To get the best out of your Amiga I'd advise adding at least another 2Mb of memory. This will give you enough overhead to be able to work easily in 16 colour high resolution overscan or play back reasonably sized animations.

VIDEO DIRECTOR

I have bought Gold Disk's *Video Director* and want to use my Sony EVC-3 Video8 VTR as a source deck but as the LANC socket is a 5-pin DIN and the Gold Disk interface terminates in a 2.5mm stereo jack plug, could you please suggest an adaptor or supply a wiring diagram to enable me to use Video Director in automatic mode.

NB: the Sony 5-pin to stereo line socket won't work as only 2 pins are connected.

Ian Pickering
Scarborough
N Yorks

I'm sorry to say that I've drawn a blank on this problem so far. I can tell you what the DIN pins on your EVC-3 are, but not how to connect them to the *Video Director*'s interface, since I couldn't find out how it is wired up. For the record, here are the DIN connections:

PIN 1 – Not connected
PIN 2 – Serial Data
PIN 3 – Ground
PIN 4 – Serial Clock
PIN 5 – DC +5V

I spoke to HB Marketing, which distributes Gold Disk products, and it said that it would be quite willing to help by talking to Gold Disk in the USA to try and get further information for you. So the best I can advise at this stage is to give HB Marketing a call on 0753 686000 and explain your problem. You might just get lucky!

GENLOCK GEN

I'm considering buying a genlock to use with my VHS home video equipment so that I can add titles and graphics from my Amiga 500 to my home movies. I don't need anything too fancy, just something which gets the job done. As usual, money is a bit tight too, so perhaps you could give me a few pointers as to what I should be looking for?

James Martin
Leigh-On-Sea
Essex

Everybody and his dog seems to be producing Amiga genlocks nowadays, and if you read the adverts then each one is the best thing since sliced bread – which makes sense as there's no mileage in advertising anything to the contrary, is there? The problem is, how do you know what to buy if you don't know what you need?

Obviously one of the first considerations has to be cost, because however good the kit is, it's no good at all to you if you can't afford it! With prices ranging from less than a hundred pounds to up into the thousands you've got to draw the line somewhere.

A second consideration must be quality. Not just the quality of the genlock, but also the quality of the video signal being fed into it. It's all very well splashing out big bucks on a shiny, well-equipped broadcast quality unit, but what's the point when it will only ever get VHS put through it? Result – total waste of money.

Thirdly, you have to decide which features you might need. For instance, do you want to fade graphics up and down over video? Maybe you'd like to be able to mask out areas of the video, like a 'keyhole' effect. You might want to be able to adjust the colour or brightness of the incoming video, or you may need RGB pass-through to feed your Amiga monitor. Some people will need S-VHS compatibility, others just composite input.

So make up a list of what you think you require. Then start reading magazines – reviews, adverts and news pages. Check out prices, and note that some dealers charge less than others.

Put a short-list together and see if you can get further information from either the dealer or the manufacturer. Check up on things such as guarantees while you're about it. Don't forget to check readers ads for second-hand kit either – there are often bargains to be had!

Since I don't know what your exact specifications or budget are I can't recommend one genlock out of many, but ones which you should be considering if money is *really* tight include both RocGen genlocks, the MiniGen and the Rendale 8802, all of which will work satisfactorily with your Amiga 500 and VHS.

There are lots more genlocks to choose from if you have more pennies – G2 Systems, AST, Magni, Electrocraft, Videocomp and Electronic Design all make a good range of units.

Check out the adverts in magazines such as *Amiga Shopper* and *What Video* for suppliers.

1901 TROUBLE



Is there any way which I can internally alter my Commodore 1901 monitor so that the existing digital RGB input can be used with my Amiga 500 to allow the monitor to display analogue RGB – ie display all 4096 colours instead of the 16 I am currently limited to?

I recall reading an advertisement by Trilogic for the above conversion, but since this was at the time of the C128, for which the monitor was intended, I am quite prepared to do the job myself.

Ben Anderson
Huddersfield
W Yorks

Well, I called Trilogic (0274 691115) and the people there informed me that they are still doing the modifications – which involve adding some circuitry, a SCART socket and so on – to bring the 1901 up to the output of a 1084 or Philips RGB monitor.

If you send Trilogic the monitor it will do the mods, supply a new SCART to Amiga cable and return the monitor to you within 48 hours. The cost will be around £50, but call first to confirm. Hang on, here's a thought… if you have a car you could probably take the monitor to Trilogic yourself as it is just a short trip up the M62 from you – and save a few bob too, maybe.

CUT IT OUT!



Could you tell me what I need to do so that I can edit my video tapes into a more presentable form.

At the moment I've got lots of tapes with pictures that I want to keep, but there's also loads of rubbish I don't want in there. I'd also like to use my Amiga to add titles and details of dates and places so that I can keep track of everything. Any help would be appreciated.

Gill Morrison
Peckham
London

If you're not too worried about the absolute timing of everything, just so long as you get the bits you want stored away more efficiently, then the simplest way is to just copy from one VTR to another, using pause and record to paste together the sections you want. To do this just join two videos together by connecting the audio and video outputs from one machine (which will become the 'source') to the audio and video inputs of the second machine (the 'recorder').

If you can, try to avoid using the aerial-type RF connectors, because while this might be easier, you'll get less "generation loss" by using the dedicated audio and video inputs and outputs. If you're using a genlock to add graphics you won't be able to use these connectors anyway.

The connectors could well be different on each VTR, so you should check beforehand that you have all the correct leads for the job. If possible, have a TV or monitor for each VTR, as this will make life easier for you.

If you use a genlock, make sure that it is connected between the video out of the source and the video in of the recorder and that it is also connected to your Amiga's RGB port.

When you're done connecting, it's time to start editing. The first thing to do is to record some black video and an identification header at the start of the tape. Not only will this help you to quickly identify the tape, it will also help protect it, as it's the start of a tape which takes the worst beating and hence gets the most wear and damage. If you are using a modulator, disconnect your record VTR's video input and connect it to the modulator's video output in instead. Load a paint or titling program such as *Deluxe Paint III* or *Home Titler* and produce a black screen. Record about a minute of this on a new, good quality video tape. Stop or pause the recorder, prepare your first titles (eg My First Tape, August 1992) and then record say 30 seconds of this. If you stopped the tape it is best to wind back very briefly so that there will be no visible join. Use Pause wherever possible, but remember that a VTR will generally stop after a certain time in pause mode. To avoid this, some forward planning is recommended. Prepare your graphics in advance and know where the parts of the tapes you want to transfer are (use tape counters, make notes etc).

Reconnect the source VTR if you were using a modulator and copy the first section of video across. Pause the recorder when the section is finished, find the next one on the source tape and release pause. Keep repeating this operation until you have what you want. Add titles as needed. And finally, voilà!, an edited tape.

As you'll gather from the above procedure, this is a rather rough and ready way of editing, but it proves that it is possible to get results out of some relatively simple equipment.

There are many other ways to skin this particular cat (mine were out of the room when I wrote that bit!). One would be to use a program like Gold Disk's *Video Director* (as long as you had compatible VTRs or camcorders), another would be to use a dedicated edit system, either Amiga-based such as Syntronix' *EditMan* or EMR's *VideoPilot* (again with the right VTRs), or a fully-blown dedicated video editing suite, which you could probably find for hire locally, usually at a daily or hourly rate. It all depends on your particular needs.

DISNEY TIME



I want to use my Amiga to do 2D and 3D animation. I already have a hard drive (A590) and 3Mb of memory on my Amiga 500 Plus. Can you suggest some 3D programs which might be suitable for beginners, and any other equipment which might be useful to add to my present set-up.

J Andrews
Stoke

With such a range of 3D programs now available for the Amiga it's hard to know where to start. I always thought that *Sculpt 3D/4D* programs were fairly easy to learn, likewise *Real 3D*.

Videoscape 3D is too much of a headache to use to really justify recommending it nowadays, though it was good in its day. Personally, I favour *Imagine* because I've followed its evolution since its early days as Silver and I have spent thousands of hours using it, but I wouldn't normally recommend it for a novice unless they are really determined to learn how to use it. Another program which I've only heard about recently is *Expert-4D Jr* which, according to the recent reviews, sounds pretty interesting – especially at around £50.

There are also a few PD 3D programs, such as *RayDance* and *DBW Render*, but unless you're totally skint I wouldn't recommend them simply because they use scripts rather than graphic interfaces, and this can be a real pain, even for experts!

I'd love to recommend *Lightwave*, the excellent 3D package bundled with NewTek's Video Toaster, but unfortunately you have to have the Toaster to run it, and as an NTSC device it's not that much use to most of us in Europe.

There are other programs, including *Reflections*, *Caligari*, *3D Professional* and *Design 3D* which all have endearing features. However they also have some handicaps which bias me against them – for example *Reflections* is a German program (with no English manual) and *Caligari* just causes me frustration even though the results can be excellent.

So, my own recommendation would be *Imagine 2* (if you can take the learning curve), then *Real 3D*, then *Sculpt 4D*. All of these programs have their idiosyncracies and specialities, and *Imagine* and *Real 3D* definitely outperform *Sculpt* nowadays.

Remember though that 3D rendering is *extremely* time consuming and the addition of a turbo card would help greatly. You will also run into memory constraints from time to time, especially if you are using texture or brush mapping techniques, so extra memory should be considered.

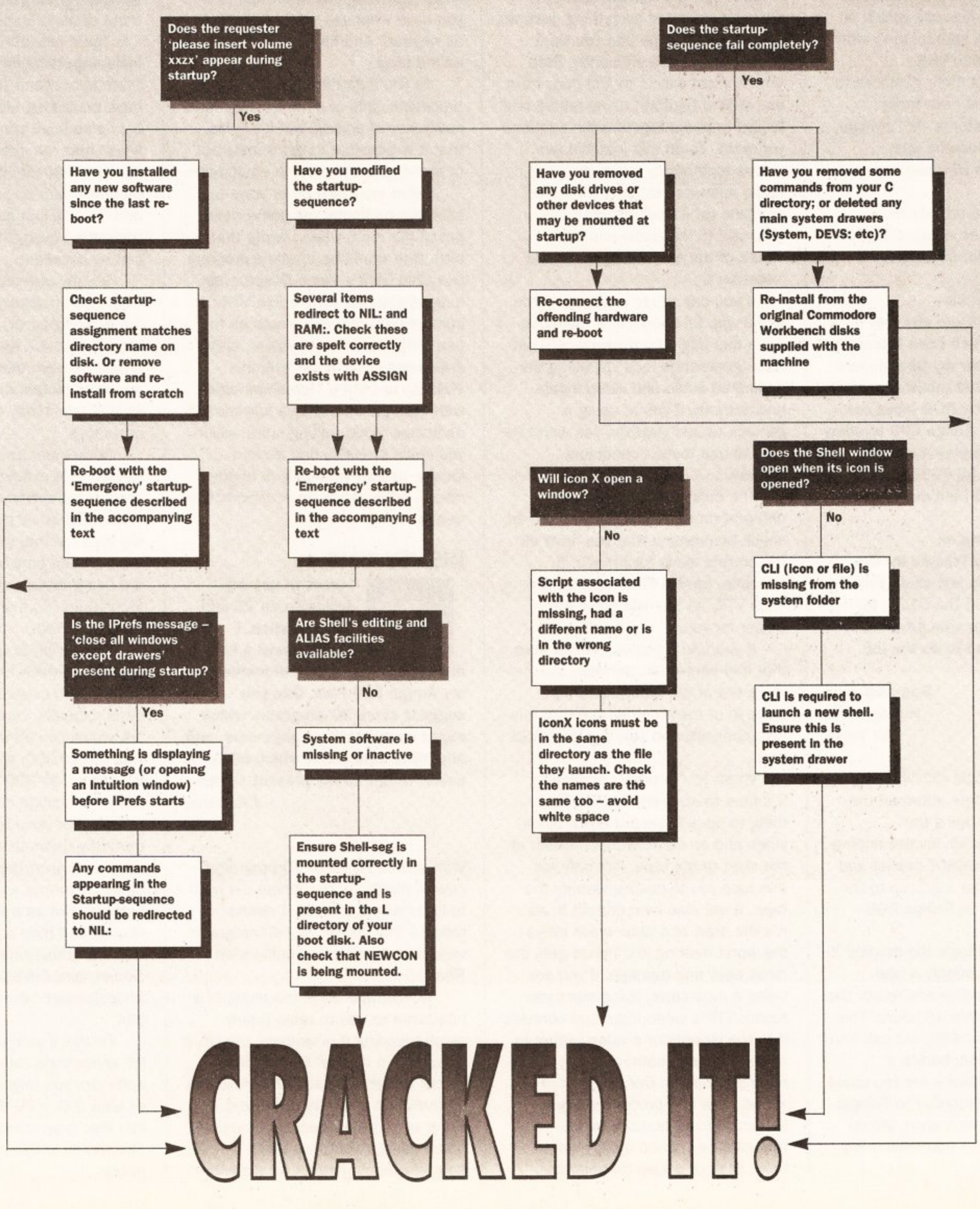
If you wish to use 24-bit rendering (which *Imagine* and *Real 3D* are both capable of) then you'll need a display card such as *AVideo 24*, which can be installed inside your Amiga 500, to output the images on an RGB monitor in their full glory, though to animate them you'll either have to record them frame by frame to a suitable video deck or convert them to HAM or other IFF format which is capable of being shown as a standard Amiga display and then animate the frames together. Programs such as *Art Department Professional* and *Imagemaster* can help you to achieve this.

Finally, if you just opt for making IFF animations with your 3D software, you might like to get hold of *View 3.0*, a PD IFF viewer which can also play animations, or *ShowAnim*, which is an IFF anim player.

AMIGADOS...

In a stupour over startup? Feel like putting the boot into boot? Mark Smiddy provides the solutions so you can be sure of Shell

AMIGADOS DEBUGGING CHART



ANSWERS SPECIAL ANSWERS SP

RESIDENT CODE

Is it possible to make programs such as FORMAT resident for speed? And, most importantly, is it safe to do?

Paul Rickard
Lytham St Annes, Lancs

Most software can be made resident – even quite large applications – provided the code is pure. Generally speaking you will only make frequently used software – such as AmigaDOS commands – resident in RAM so they are readily available. You can force-load a command to the resident list using the PURE switch like this:

```
1>RESIDENT SYS: ↵
System/FORMAT PURE
```

(This example only applies to versions before 1.3 by the way, in later releases most of the system software is pure. The command format remains the same no matter which version you are using).

Next, you must determine whether or not the code is re-entrant and re-executable.

Re-entrant code is vital if you intend multi-tasking since several processes will be sharing the code at the same time. If you just want the command available, this is not important. However, the command must be re-executable, or it will be completely useless – and this is the first test.

1. Force load the program as described above and execute it. If the program uses Intuition, make sure you use all the options at least once.

2. Exit and reload the program. If it crashes or if any of the settings remain from the last invocation, the program is not re-executable and must not be made resident.

3. If the program passes the first test, open a second Shell and execute it from there at the same time. This will force EXEC to use the same copy of the code twice and if it is not re-executable, it will crash in spectacular fashion. If everything goes all right you can assume the program is safe to make resident, if not you can still make it resident provided you can be sure no more than one copy of it will be running at any one time.

PATTERN MATCHING

How can I use pattern matching to select a directory?

Peter Dennis
South London

In AmigaDOS 1.3 you can use the command extension, SPAT to perform single pattern matching. It works like this:

```
1>SPAT CD DEVS:K#?
```

From AmigaDOS 2 onwards, CD has pattern matching built in – it even supports multiple patterns too. Here are a couple of examples:

```
1>CD DEVS:K#?
1>CD :De#?/K#?
```

SEQUENCE WON'T WORK

The eclectic Startup-sequence (*Amiga Shopper* 16) does not work on my 2.04 machine – why?

Dave Stebbings
Bromley, Kent

This problem only came to light when the software was released on an audience with many different machine configurations. There are actually several combinations of the Kickstart 1.3/2 ROMs and Workbench software and this is the problem. Here are the two lines causing the trouble:

```
WHICH >RAM:version ECHO
SEARCH RAM:version "RESIDENT"
IF WARN
etc.
```

Line 1 asks the machine where the ECHO command is located and this relies on the WHICH command returning a string:

`C:ECHO` – for AmigaDOS 1.3
`RESIDENT ECHO` – for AmigaDOS 2.0

This is the problem: WHICH does not return RESIDENT on AmigaDOS 2, but INTERNAL. This program was taken from a working startup but the wrong version of WHICH was being used. Also, some 1.3 machines have a problem with the RAM disk – since this code is only for hard disk machines, it was decided to use T instead.

The first three lines of this code can be fixed in one of two ways:

```
WHICH >SYS:T/version ECHO
SEARCH SYS:T/version ↵
"RESIDENT"
IF WARN
etc.
```

or

```
WHICH >SYS:T/version ECHO
SEARCH SYS:T/version "C:"
IF NOT WARN
etc
```

A better solution will be provided in next month's AmigaDOS column.

COPY CONUNDRUM

The COPY command in MS-DOS can refer to the current directory – how can this be done in AmigaDOS?

Darren Tate
Stockton on Tees, Cleveland

MS-DOS uses a period internally to refer to the current directory, but AmigaDOS has no direct equivalent. However, you can supply a null argument ("") to fox AmigaDOS into using the current directory. For example:

```
1>COPY "" TO RAM: ; copy ↵
from current directory
1>COPY RAM: TO "" ; ↵
copy to current directory
```

You must supply the pair of quotes to avoid confusing the AmigaDOS command line parser which in this case is looking for two required arguments.

ON THE MOVE

How can I move several files from one directory to another without using COPY and DELETE?

Carolyn Knight
Chiswell Green, Herts

AmigaDOS supplies the RENAME command to do this. Although RENAME is usually used to change file names it can also move things around between directories. For instance to move a file from DEVS: to a directory called "SYS:Text/Archive"

```
1>RENAME DEVS:MYFILE ↵
SYS:Text/archive
```

Unfortunately, RENAME does not support pattern matching but you can get around this using a special command extension script supplied from AmigaDOS 1.3. It's called DPAT and here's an example:

```
1>DPAT RENAME ↵
:devices/archive/#? to DEVS:
```

MORE HELP

Can I prevent MORE from clearing the console window?

John Connor
Adlington, Lancs

Yes. When you use more as a direct command it shares the current console window with you. However, if you launch it as a sub-process it will open its own private window. For instance:

```
1>RUN MORE S:Startup-sequence
```

PERSISTENT WINDOWS

When I start a program from the Startup-sequence using RUN, the initial CLI window does not close unless I quit the program. How can I get around this?

Sid Day
Southend, Argyll

This is quite a common problem and one which affects the main Shell window too.

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

AmigaDOS – The part of the Amiga's operating system that helps take care of the general running of the machine. AmigaDOS concerns itself with device-handling: control of the keyboard, basic screen output, disk drives, printers and so on.

Directory – A method of storing files on a disk in a heirarchy. A directory is a sub-section of a disk which may contain files and/or further directories. In this way similar files can be grouped together.

Multi-tasking – The ability of a computer to run more than one program at once. In practice only one program is run at a time, with others waiting for their turn. The part of the Amiga's operating system called Exec handles the switching between programs, which is done so quickly that they all appear to be running simultaneously.

RAD – An area of memory that can be used just as if it were a disk drive. The advantage of RAD is that access to it is much faster than to a floppy or even a hard disk. Unlike an ordinary RAM disk, RAD retains its contents after a reset.

Script – A grouping of AmigaDOS commands held in a text file that may be treated as a single command.

Startup-sequence – A program that is executed very time the Amiga is switched on or reset.

When you start a program using RUN, AmigaDOS creates a 'child process' which is hooked to the main Shell window.

In all practical terms, RUN is identical to NEWSHELL – only it does not open a new console window. The application started shares its console input and output (display) with the original Shell.

Even applications which do not use the Shell windows at all will often grab the console handles – this is a feature of C compilers.

In order to allow the console window to close you must give the child process some dummy handles to cling on to – that's what the NIL: device is for. Typically, you launch a background process like this:

```
RUN <NIL: >NIL: SomeProgram
```

If you do this much from the Shell proper (ie, not in scripts) a shorter solution is to define an alias to do the hard work for you:

```
ALIAS RunBack RUN <NIL: >NIL:
```

The alias is used like this – here we start ED in the background editing the Shell-startup file:

```
1>Runback ED S:Shell-Startup
```

AN EMERGENCY START-UP

An emergency start-up is one of the most useful things you can do if you intend fiddling around with the main (or, 1.3 only, secondary) startup-sequences. It couldn't be much simpler and here's how...

Open a Shell and enter:

```
1>COPY S:Startup-sequence to S:EmStart
```

If you are using Workbench 1.3, you will also need to do this:

```
1>COPY S:StartupII to S:Startup2
```

Edit EmStart using:

```
1>ED S:EmStart
```

and include the following instruction at the first line.

```
FAILAT 21
```

Workbench 2 users should skip to the next section now.

Find a line which reads:

```
RUN EXECUTE S:StartupII
```

and change it to read:

```
RUN EXECUTE S:Startup2
```

If something goes wrong during the startup, all you have to do is reset the machine and hold down the "Ctrl" and "D" keys together. This will stop the startup-sequence and allow you to enter:

```
1>EXECUTE S:EmStart
```

This will start the machine normally using the default Startup-sequence.

USERS WITH WORKBENCH 2 ONLY

After you finish editing EmStart, enter the following:

```
1>PROTECT S:EmStart +S
```

When you re-boot the machine hold down both mouse buttons until the special startup screen appears. Select the advanced options with the mouse and click the button at the bottom of the screen to disable the startup-sequence. Now return to the main screen and select DF0: (DH0: if you're booting a hard disk). When the Shell window appears type:

```
1>EmStart
```

This will boot the machine from the emergency startup script. The IPrefs daemon will present a requester moaning about open windows – this is quite normal and nothing to worry about.

ICON CHANGE

How can I change the RAM disk's icon on Workbench?

Stephen McNabb
Kilmarnock, Ayrshire

First off, you have to create a new dot-info file with the icon type "disk". The simplest way to do this is copy one from another disk, so let's assume the disk in DF0: has an attractive icon:

```
COPY DF0:disk.info RAM:
```

Nothing will appear to happen to RAM's icon at this point. If you have Workbench 2, reset the Workbench using the selection on the tools menu. Workbench 1.3 users can get the same effect using:

```
1>LOADWB
```

and you will notice RAM's icon change to the new design.

To make this more permanent, you must copy the icon to your boot disk – but with a different name otherwise it will overwrite the existing disk.info. Do it like this:

```
1>COPY RAM:Disk.Info to ↵
SYS:Disk.Inf
```

Now add the following line to your Startup-sequence (User-startup for AmigaDOS 2):

```
1>COPY SYS:Disk.Inf to ↵
RAM:Disk.Info
```

RADICAL SOLUTION

Why can't I mount RAD:? How can I change the size of RAD:?

Phil Moore
Redcar, Cleveland

There are several reasons this might happen, but since RAD requires a contiguous chunk of memory, it is most likely your machine cannot fulfil RAD's requirement. This is particularly true on A500 Plus machines which although fitted with 1Mb memory, come with a default RAD disk size of 880K. You should fix this by reducing the size of the RAD disk or fit more RAM.

If you are sure you have enough RAM, it may be your machine's memory is fragmented. This can be fixed by re-setting the machine.

RAD is a device and like all manually mounted Amiga devices it has an entry in the "mountlist". The mountlist is a text file located in the devs directory of your boot disk so you can view it like this:

```
1>ED DEVS:Mountlist
```

Each entry starts with the name of the device and ends with a "hash" or "gate" symbol – #. RAD looks like this:

```
RAD:
Device = ramdrive.device
Unit = 0
Flags = 0
Surfaces = 2
BlocksPerTrack = 2
Reserved = 2
Interleave = 0
LowCyl =0 ; HighCyl = 21
Buffers = 5
BufMemType = 1
#
```

(AmigaDOS 2 users will note the item "HighCyl" is set to 79 by default.) The entry we are interested in is, HighCyl and applying the formula:

```
Size = (HighCyl + 1) * 11
```

gives the size of RAD in K. For instance, substituting the default values gives:

```
Size = (21 + 1) * 11 = 242K ↵
(AmigaDOS 1.3)
Size = (79 + 1) * 11 = 880K ↵
(AmigaDOS 2.04)
```

Also, the formula:

```
HiCyl = (Size in K/11)-1
```

can be used to determine the value of HiCyl given a required size of RAD. If you have AmigaDOS 1.3.2 or higher you can calculate this approximately with EVAL, viz:

```
EVAL (500/11)-1
```

This example gives HiCyl a value of 44 and a RAD disk of 495K.

RESIZING RAD

Is it possible to have a small RAD sometimes and a large one for other occasions – for instance, when I'm programming?

Paul Stubbs
St Agnes, Cornwall

It is practical and quite sensible to have more than one RAD device available at your command. To do this you should create an entry in the mountlist for each RAD with the size you want; and provided the device name is unique, AmigaDOS will recognise the one you want. The following mountlist entries would suffice (the second can also be booted from AmigaDOS 2):

```
BABYRAD:
Device = ramdrive.device
Unit = 0
Flags = 0
```

```
Surfaces = 2
BlocksPerTrack = 2
Reserved = 2
Interleave = 0
LowCyl = 0 ; HighCyl = 10 ; ↵
121K RAD disk
Buffers = 5
BufMemType = 1
#

DISKRAD:
Device = ramdrive.device
BootPri = 6
Unit = 0
Flags = 0
Surfaces = 2
BlocksPerTrack = 2
Reserved = 2
Interleave = 0
LowCyl = 0 ; HighCyl = 79 ; ↵
880K RAD disk
Buffers = 5
BufMemType = 1
#
```

A PROVISION OF RADS

Can I have more than one RAD disk available at once?

Peter Workman
Newton Abbot, Devon

This is possible in AmigaDOS 2, although generally speaking it is not a good idea. When you have created two different RAD device entries in the mountlist, you can mount them as normal, viz:

```
1>MOUNT RAD1:
1>MOUNT BIGRAD:
```

ALIAS AUGMENTATION

Can ALIASed commands take parameters?

Mike Meakin
Hazel Grove, Lancs

Yes – but only one as a general rule. You can insert the string "[]" at any point in the command line and the first argument you supply will be inserted at that point. For instance, the alias:

```
ALIAS QF FORMAT DRIVE DF[]: ↵
NAME "Empty" QUICK
```

can be used like this:

```
1>QF 0
```

to format any disk in drive 0. However, you can add any extra arguments as you normally would, like this:

```
1>QF 0 NOICONS
```

WHAT A BIND

Can you tell me what the difference is between a late-binding and non-binding assignment in AmigaDOS 2?

Terry Hope
Portsmouth, Hants

These two options were added to the ASSIGN command to give it more flexibility. First of all consider what assign does:

```
ASSIGN Logical_Name: ↵
AmigaDOS_Directory
```

for this to work, the directory path to which the name is being assigned must be present and available on a currently mounted volume. This enables ASSIGN to locate the directory and get a "lock" on it. If the path cannot be found, AmigaDOS will ask for a volume if one has been specified – and that is the crux of the problem. Consider this:

```
1>ASSIGN LIBS: ↵
Extra_Libraries:Libs
```

In this case you are attempting to assign the libraries directory to a volume called "extra_libraries" which would not be a problem, provided the volume is available (in some disk drive) when the command is executed. Imagine doing that in a Startup-sequence!

What is needed is a way of creating an assignment which is not called until something requires it – that's what the late and non-binding assignments do.

Late-binding assignments work in much the same way as the original ASSIGN command, but wait quietly in the background until the assignment is called.

At this point AmigaDOS tries to locate the directory path and obtain a lock on it. Once achieved, the lock remains – the path is attached to that disk – until something changes it. AmigaDOS uses this feature to "bind" ENVARC:

Non-binding assignments create temporary locks. When the logical device is accessed, AmigaDOS will access any path which happens to fit the bill. Although it will still ask for a disk, any volume with the required name and directory path will suffice. This option is probably the more useful of the two because (for example) it will allow some software to access many different disks of bitmapped fonts. This could be achieved thus:

```
1>ASSIGN FONTS: DF1:Fonts ↵
PATH
```

PROCESS OR MULTITASK

What is the difference between a process and a task?

Gary Busey
Hartelpool, Cleveland

Everything and nothing depending on how you view them. Tasks are handled by Exec (part of Kickstart) and processes are handled by AmigaDOS.

In order to support multi-tasking, AmigaDOS processes operate on the back of Exec tasks. This is analogous to a car body and the chassis that supports it. The AmigaDOS process (the body) is built on top of the engine, gearbox and running gear (the task). As in a car, the body is little use without the chassis assembly.

PROCESS LIMIT

Why can I only have 20 processes running at once?

Ted Danson
Crewe, Cheshire

This only affects early Kickstarts up to 1.3 and is basically just the way AmigaDOS worked.

Each AmigaDOS process (Shell or CLI) was allocated a "slot" in the process table. The designers fixed the size of the table to 20 and that's the end of the story. In AmigaDOS 2 processes are added to a linked list – the size of which is determined by available memory. In theory therefore, you could have hundreds of processes running at once.

A SKIP AND A JUMP

Why does SKIP backwards fail when it has to jump over an EXECUTE instruction?

Gary Smith
Watford

For every file it runs, EXECUTE creates a temporary parsed file in the T: assignment: "Command-XX-YY" where "YY" is the calling process number and XX is the nesting level. The nesting level is not used, and consequently the old parsed file is overwritten by a new one.

The solution is to run the second script as a child process which will ensure the name conflict does not arise. For example, the script:

```
1. LAB Start
2. EXECUTE An-Other
3. SKIP Start BACK
```

will create Command-00-01 in T: as it starts. When line 2 is reached, EXECUTE creates a copy of "An-Other" as T:Command-00-01 thus overwriting the previous file so when Step 3 is reached, the label does not exist.

Here is one possible solution:

```
1. LAB Start
2. ECHO >T:Process "<$$>"
3. RUN EXECUTE An-Other
4. WAIT >NIL: 5 MINS
5. SKIP Start BACK
```

Step 2 creates a temporary variable containing the process number. Remember, unless this is a startup script, it is not possible to guarantee which process is executing the program.

Step 4 ensures the script does not continue until "An-Other" has completed.

The actual amount of delay is arbitrary, but it must be sufficient to prevent the first script from continuing before the second one completes. The last line of "An-Other" (or the last instruction executed before it completes) should read like this:

```
BREAK <T:Process >NIL: C ?
```

This instruction "breaks" the wait state entered at line 4 of the previous script.

DOLLAR DOLDRUMS

What does <$$> mean in script files?

Stuart Anderson
Ambleside, Cumbria

The angle bracket characters (set by default) always enclose a script variable. Most of these are defined by the command line argument, but this one is generated by AmigaDOS. It inserts the process number of the current process (shell).

Some programmers change the bracket and even the dollar characters too – you'll see these changes in the first few lines of the script as dot commands. Typically, brackets are changed to braces "{...}".

POOR EVALUATION

Why does EVAL return the wrong result sometimes?

William Hill
Gateshead

Eval is "bugged" in the early releases and requires a very strict command line format to work. For instance:

```
1>EVAL 1+2
```

will not work, whereas:

```
1>EVAL 1 + 2
```

would. It is not strictly correct to say EVAL is bugged, the interpreter just works that way and the only fix is to use a later (1.3.2) version. However, the later EVAL has problems of its own. The improved command line parsing includes full operator grouping according to mathematical rules.



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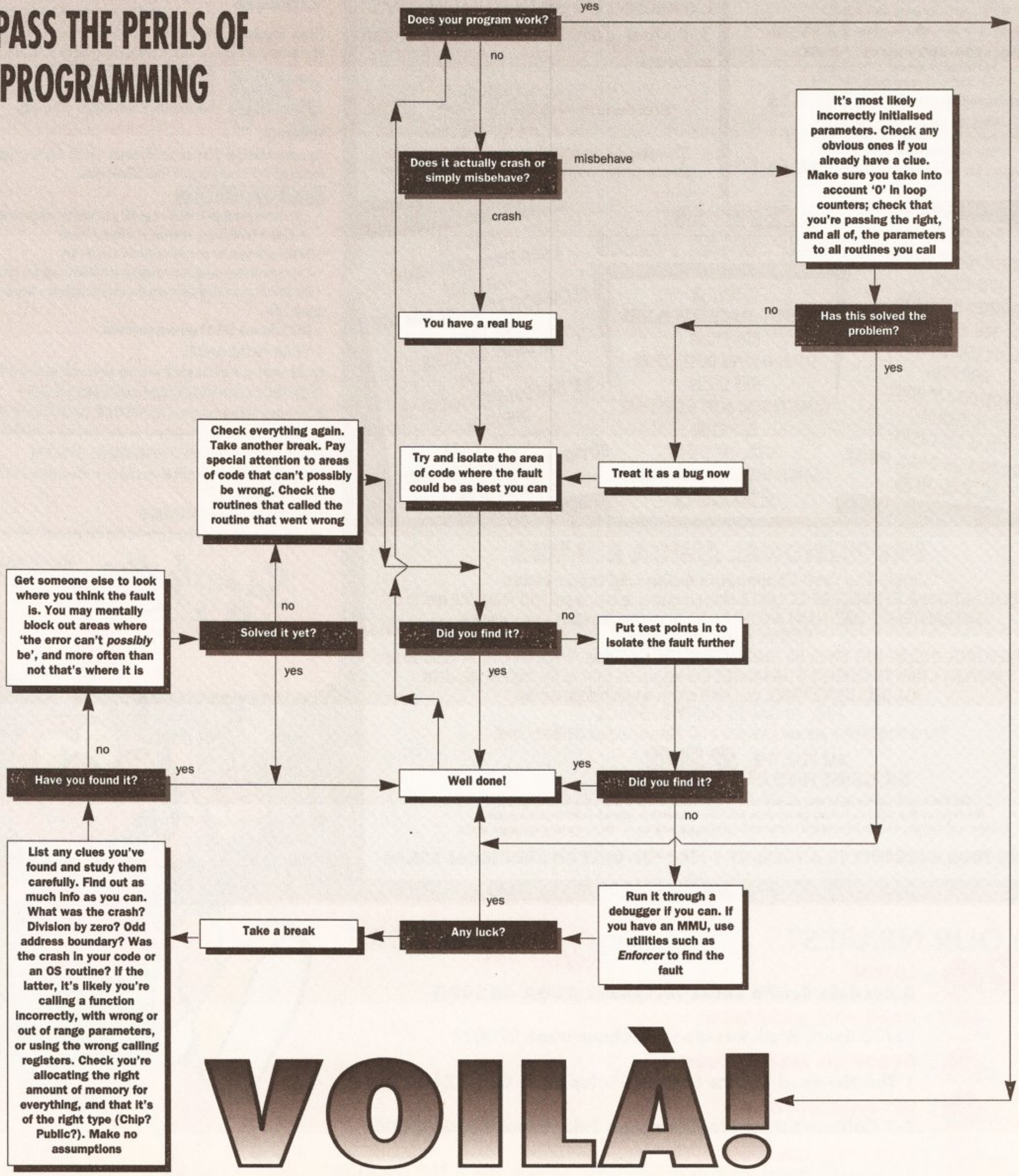
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PROGRAMMING

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BYPASS THE PERILS OF PROGRAMMING



SCREEN TAKEOVER BID

I have written a program that takes over the screen display by writing to the hardware registers in the Amiga. It is written in Assembly language using *DevPac*. The problem is that there is a bug in the program that I cannot find. Since I have done a Forbid to disable multi-tasking, and taken over the Amiga hardware, I cannot use a standard debugger. Have you got any suggestions as to how I can find the bug?

J Saunders
Norwich, Norfolk

There are a number of solutions to this. Firstly, you must ask yourself if taking over the machine like this is actually necessary. Unless you're writing an action packed scrolling arcade game, there isn't really much excuse for hitting the hardware like this these days – and even in the case of the game, the case for

> The only thing more dangerous than a programmer with a screwdriver is a user with an idea

sticking to the operating system is mounting all of the time. If, however, you have to program in this way then you ought to bear a number of things in mind anyway:

Should Commodore upgrade the Amiga's Custom chip hardware in the near future, you might find your program breaking. I would strongly recommend that you add these few lines in *before* you write to *any* of the custom chip registers:

```
LoadView(NULL); /* Load a
NULL view to stop the system
copper list */
WaitTOF();
WaitTOF();        /* Wait for a
couple of screen blanks to
allow the system enough time
to shut down its copper list
*/
```

Now write to the registers. All three of those functions are found in the Graphics Library. They are quite straightforward to call in assembly language. What that code fragment actually doesis disable the Amiga's normal intuition display and wait for a couple of frames to ensure that its copper list is "clear". It's the polite way of saying "Tidy up, I'm taking the hardware." The OS is clever enough to then disable any weird and wonderful hardware functions that you may not know about. This is by no stretch of the imagination an ideal solution: it's a workaround. The best way of doing a custom display is by using your own "View". If you're interested in learning about a "View", then consult the Amiga Libraries book, Edition 3.

Back to your original problem. The key to success in any major debugging session is to *narrow down where it can be!*

In the last major program I wrote, the main code segment was just over 60,000 lines long (all assembly language). Finding a strange bug in that was like looking for a needle in a haystack to be honest. The best way to hunt the little things down is to try and eliminate as much of the program as you can. Disable every routine you can to try and work out where the bug can be.

When you have established the basic area the fault is in, add little bits of code to indicate how far the program got before it crashed. In OS friendly programs, simply printing "I got to the XXX routine" on the console window is a good way of going about this. For your particular problem, I would suggest flashing the screen various colours. That way, if it crashes shortly after making the screen bright yellow, you would know exactly how far it got. Then it should be quite straight forward for you to find the actual fault.

If you have an MMU, however, then there are some other options available to you. With an MMU you can run some very interesting tools indeed. *Enforcer* is worth a special mention. With *Enforcer* running and a terminal attached to your serial port, should your program do anything naughty, such as write to illegal memory areas, then a complete register dump goes over to the terminal together with the reason the fault happened. This process of *Enforcer* dumping its information across is called an "*Enforcer* Hit.".

DOUBLE BUFFERING

I have written a game in assembly language, but I have screen flicker. I wait for a vertical blanking gap, and then clear the screen with the blitter before blitting all of my game sprites to the screen. When I am using more than a few BOBs, I get serious flicker. I don't know how to solve this. I have heard "double buffering" might help me, could you explain what this is?

Mark Ball
Crawley, W. Sussex

Double buffering is a very simple concept employed in most computer games, especially on the Amiga, to ensure you don't get screen flicker. The reason your screen is flickering is because you are unable to draw all of your sprites fast enough to fit in the vertical blanking gap, and the custom chips are drawing the next

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Beta-testing – This is an important phase of development which takes place after the program has been mostly finished. The aim of Beta-testing is to try and remove all of the bugs in order to increase program stability. Beta-testing can take months on large projects, and can involve many people.

Breaking – A general term for a program not functioning as it should do. For example, "My word processor worked fine on the A500, but broke on the A3000."

Bug – An error in your program. They come in all different shapes and sizes, from the little well hidden, almost invisible ones that you have to employ the most incredible debugging tools to get out to the blindingly obvious ones that you can't see, but everyone else can!

Compiler – Being lazy souls and wanting to make their jobs easier, programmers started to group collections of machine code instructions together which performed a particular job, and give each of them a name. When they had written their programs using these names, they ran them through a program called a "Compiler" which converted each of the "higher level" instructions to the various machine code instructions which could then be ran directly.

Crash – When your program fails badly. A typical crash on the Amiga might involve a Guru meditation, forcing a complete reset of the Amiga.

Enforcer – A Commodore-produced development tool which traps all of the naughty things your program might do, and pumps information about the slip-ups over the serial port for you to examine.

High Level Language – As a general rule (very general!) the higher the level the language is, the easier it is to read, program and learn. A good example of a high level language is Basic. Slightly lower than Basic might sit C, and somewhere at the bottom of the scale sit Assembly Language and Machine Code. The lower you get, the closer you are to the binary operations of the computer itself. In the case of Assembly language, each instruction you type is one machine code operation. This one-to-one is as low as you can get. As you get higher up the scale, your one command might result in many machine code operations being produced.

Interpreter and "stand alone programs" – An interpreted language is one in which, instead of pre-assembling or compiling a program to run directly, the program compiles as it runs. This makes for much slower programs that are not "stand alone." What this means is that as the program is compiled and executed as it goes along, the interpreter always has to be there. In the case of Assembler, or compiled languages, the compiler/assembler only needs to be around at the time you compile/assemble the program, and not when you run it.

Low level language and machine code – The lowest level of programming language on the Amiga is machine code. This involves entering numeric values directly into the Amiga's memory. It is time consuming, and was the way people programmed computers twenty years ago. Programmers replaced the numeric values with small words that described what the number did, for example, "add" instead of the binary number 10110101. They then wrote using these words, and used a program called an "Assembler" to translate the words to the appropriate binary numbers. This process of using mnenonics to represent binary instructions is called "Assembly Language Programming" and is the lowest form of programming language still in general usage.

MMU – Memory Management Unit. One of the handy toys that your 68020, '030 or '040 card might have. If it does have one, you can use a number of very nice debugging tools indeed. Amongst its other features, an MMU enables you to trap illegal memory accesses and jump in to see what happened. This is one of the things that *Enforcer* can do.

Stability – A term, when used in reference to programs, referring to how "crash proof" it is.

frame whilst you are still blitting to it. Double buffering, in its simplest forms, involves you having *two* screens, a hidden one, and a visible one. Basically, you draw on the hidden one, and when it's fully drawn, simply swap the two banks, then draw on the new hidden screen. This way you can take as long as you like to draw your new frame without worrying about flicker. Watch out, however that your program doesn't run "as fast as it can": install some code to make sure that if it's running on a very fast Amiga that it doesn't swap the banks too quickly. Try playing *Interceptor* on a 25Mhz 68030 and you will see what I mean – it's like trying to land the plane on a postage stamp!

GET BY WITH A BOOK

I have had an Amiga for three years now. About a year ago, I decided to learn Assembly Language. Here I am, a year on after reading several books which frankly tell you very little about how to manipulate the language. I know most of the instructions but I do not know how to put them together without the machine crashing on me. What I mean to ask is: do you know of anyone or anywhere that runs courses in 68000 programming or a book that actually tells me how to manipulate the language rather than just telling me the addressing modes.

Richard Hobbs
E Molesey, Surrey

This is a stunningly common problem. Most of the "Learn Assembly Language on the Amiga" books aren't actually much good at teaching someone to program 68000 – they concentrate too much on the Amiga, and not enough on the concepts of Machine Code. What you need is a good book on Machine Code programming, going through the concepts of Assembly Language, how it fits together, how it all works and then teaches you to program 68000 properly. I would strongly recommend the book *Programming the 68000*, published by SyBex. It's a wonderful publication that starts with "What is a Program?" and works up from there. Armed with this book, together with the official Amiga Libraries, Devices and AutoDocs books you are ready to learn assembly language for sure this time!

ALL AT C ON COMPILERS

I own a 1Mb Amiga A500, and as a hobby I am learning to program C using the *Dice* C compiler. However, I am interested in buying a commercial C compiler, either Aztec or Lattice. I have noticed that the Aztec compiler comes in two packages, professional and development, but that you seldom see any adverts for it (the professional package being my preferred choice based on price.) Most shops advertise Lattice and I've taken this to mean that it is superior. As a hobbyist, I have to strike a balance between functionality/speed and cost-effectiveness! Could you give me a brief summary of the two compilers to help me choose which one to buy?

Paul Williams
Longevens, Gloucester

Firstly, development in C without a hard disk is a nightmare, if not nearly impossible. I would recommend that anyone thinking of taking up C programming (or any programming, to be honest) considers a hard disk and at least 1.5Mb of RAM. For *SAS/Lattice C 5.10b*, for example, it is recommended at the start of the manual that you have 2.5Mb of RAM, and at least 20Mb of hard disk space. If you want to learn more about *SAS/Lattice C*, contact HiSoft on ☎ 0525 718181. If you're after a professional package, you're best to save for the SAS/Lattice compiler, as it is a fast efficient, flexible and powerful application.

An Amiga programmer's life starts getting easier at '030, but really begins at '040

CRASHES WITH C

I have a written a program in C on my A3000 (OS 2.04) which does not work on my friend's A500 (OS 1.3). I can't find out why and I'm at my wits end. It keeps crashing on the A500 with a Guru meditation.

Tony Joseph
Harlow, Essex

I wish I knew what those Guru Meditation numbers were! But at a guess, I'd say they were 00000003.xxxxxxxx or 80000003.xxxxxxxx – Odd Address boundary. There are a number of things which could cause a program that works fine on an A3000 to break badly on another Amiga. Firstly, I shall discuss the Odd Address boundary one. The 68030 in your A3000 is a clever beast, and is capable of writing information to odd addresses, which the lesser 68000 chip – as found in the A500 is not. It's likely that you are compiling your program to be optimised especially for the 68030, which is producing code that is incompatible with the A500.

Another possible fault is that you are making use of functions that are present in Workbench and Kickstart 2, but not in 1.3. You must be careful about this sort of thing. If you are going to use routines that are not present in older operating systems, you *must* check the version numbers of libraries that you open and ensure that they are the right ones.

The only other suggestion as to what this fault could be is that you might be running very short, or indeed out of memory, or the stack is too small. C programs are notorious for using up large amounts of stack, especially if you are using recursive programming in any way (such as some of the more clever and faster sorting routines). Try typing "stack 32768" from the Shell before running your program and see if that makes any difference. As far as running out of memory goes, make sure that you are assuming nothing. Always check to see if the memory you have allocated has actually been given to you, otherwise you might suddenly find yourself using a pointer of zero as a base to your allocated memory – which will give unpredictable results to say the least.

LOST IN CODE

I have been programming for several years now, I started with Basic, then AMOS and now I am learning to program C. However, I have a problem! I am working on a big program under Kickstart 2.04, and I am having severe difficulties keeping track of it. As it gets larger it seems to get harder to find bugs, and I am getting lost in it. Could you perhaps do an article on designing programs? How would you recommend I solve my current problem?

Justin Chapman
Eltham, London

You're suffering from badly structured programming. This nasty disease causes your program to appear much larger and more complex than it actually is, and helps you to introduce bugs without noticing. Eventually you end up with a massive program that lists like spaghetti and is impossible to update and maintain. Sooner or later, you have to scrap it and start again.

Laying down a sensible structure to your program *before* you start is perhaps one of the most time-saving things you can do for later trouble shooting. Actually design your program before starting at the keyboard. Try to lay it out into separate modules which you can write and test independently of each other. This will help you to trace faults later on, and will make your program much more readable and easier for you to understand. Document each of your routines carefully, state what it does, what its inputs and outputs are, and, if it's in assembly language, which registers it requires. You may be able to remember what a routine does for a while, but should you come back to it six months later to upgrade it, unless you've put sufficient comments in you're going to find it very hard indeed to recall how it works and what it does.

Use sensible variable names, such as "player_name" rather than "pn", this helps to make your code

THE JOY OF PROGRAMMING

Programming can be one of the most rewarding, and yet at the same time, frustrating activities you can do on a computer. Finally getting a routine working that you have been trying to debug for hours, or even days, can be most satisfying! Programming, of course, is also known as the easiest method to shorten your lifespan. Its the classic stress producer. Your program doesn't work: drink more coffee, try again, repeat till you're so fed up with it that unless you leave the machine quickly you're going to punch its lights out. Drink more coffee. Of course, the problem with coffee is that the more you drink, the shorter your temper becomes and the harder it is to debug your program anyway! A good stiff drink won't help matters much either.

So how do you cope with the mounting pressure, tension and general strain of programming, produce some good programs, and not have a nervous breakdown? Well, with a few simple guidelines, common sense and some programming and debugging tips you can't go too far wrong. At the very least you'll increase your life expectancy.

It's hard to produce large programs that are bug free. Some people have said that it is actually impossible – a worrying thing when you consider that the entire American Star Wars anti-missile technology relied on hundreds and thousands of lines of totally untested code. It's quite easy, however, to produce programs that are easy to debug when they do go wrong. In the following few pages, I shall answer some programming problems people have had, and give some general advice on trouble shooting, and see if we can't save some heartache!

easier to follow. The same applies to routine names – "show_menu()" rather than "sm()", for example. In the "good old days" of computers, you had so little memory that you would have to write bad code, short variable names, short routine names, lots of statements on one line etc. This is no longer the case; you can definitely spare the few bytes it takes to make your program easier to follow and read, and it's certainly worth every second of extra typing time that might be involved.

RULES FOR CODING

A Could you give me some general advice on Assembly language programming? What are some of the most common mistakes that machine code programmers make?

B Norton
Tilbrooke
Milton Keynes

That's a tall order. There are literally millions of things that you can do wrong. Most can be avoided by sticking to the Amiga programming rules, structuring and documenting your program well, and using sensible label and routine names. There are, however, some really common mistakes that people make, and if you do run into problems, perhaps you might check this sort of thing first. These apply to most programming languages on the Amiga as well as assembly language, C especially:

• Storing a data value in a memory location that is too small. This is a good one, because it's a pain to find in most cases. It can stem, for example, from storing a long word into a word memory location, writing into the following word unintentionally and corrupting something. This is also easy to foul up in languages other than 68000. In C, for example, you might have an area of memory for a string and simply write too many characters out, corrupting memory that does not belong to you and thus producing unpredictable results. The most common cause of this in C is forgetting that at the end of a string you have a NULL to terminate it, which is an extra character.

• Using addressing modes or features that are not downwardly compatible. The 68020 has some pretty neat bit field extraction instructions which the 68000 does not have, for example. If you are relying on features of a higher CPU, then make sure your program quits gracefully if those features are not there with a suitable error message. ("I need a 68030 to run").

• Assumptions. This is definitely a popular one! It can affect most areas of Amiga programming. *Don't assume anything*. You may not necessarily get that 24 bytes of memory you asked for, the window you just tried to open might not open and so forth. If you need Kickstart 2 to run, check that you have it.

• Passing the wrong values to OS routines. This is an easy one to do: accidentally passing the wrong register to an operating system function call. Check that you are supplying all the parameters the function requires, and in the formats that it wants.

> There are two approaches to software design: one is to make it so simple that there are obviously no deficiencies; the other way is to make it so complicated that there are no obvious deficiencies

• Forgetting the upper bits in register, or forgetting to initialise registers and variables correctly. Look at this small code fragment:

```
move.b   (a0)+,d0
mulu     #64,d0
move.l   0(a1,d0.w),d0
rts
```

This routine could go seriously wrong. If d0 already contained a value greater than a byte, then the multiply and move instructions that follow it will fetch the wrong results. The programmer has failed to make sure that d0 is zero before starting, or to put it another way d0 was not correctly initialised. If your routine is going to use any variables at all, make sure that they are correctly set up.

• Failing to test programs properly. Test everything. You can't be too thorough. Check to see what happens to your program if you ran it when there was no RAM left, or with strange unpredictable parameters. This phase of seeing if your program works is called "Beta-Testing." Get some friends together also to have a play, and they will find faults that you might not be able to.

• Not having the right books. If you can afford the official Amiga Reference books, get them, especially the Libraries, Autodocs and Devices books.

WHICH LANGUAGE?



I am considering learning to program, and I don't know which language to learn. I am intending on writing some utilities. I have narrowed my choice down to C, Assembler or AMOS.

Anon

The language you should pick depends on so many things...

• What are you intending on doing with it?

If you're about to write a *RoboCod* style game for your Amiga, then C is definitely out of the running. You will need the compactness, the control and speed of Assembly language programming. At a pinch you could pick AMOS, a very powerful BASIC style language especially designed for graphic and sound based programs (such as demos, games, music and effects programs). Alternatively, if you are going to be writing large applications around the Amiga's operating system, then C would be your best bet. The OS itself is written mostly in C, and it is designed to be called and used from C. It's still possible to write such applications in Assembly Language, and lots of people still do.

• Your budget.

This is important. If you are going to program C seriously, then you will eventually need to buy a commercial compiler, such as the excellent *SAS/Lattice C*. This costs a large amount of money, but is certainly worth its weight in gold. In the meanwhile, there are some perfectly good PD C compilers now for the Amiga, such as Matt Dillon's *DICE*. There are also PD assemblers around too, but again, if you are considering programming it seriously, HiSoft's *DevPac 3* is essential. With AMOS you have no options, you have to buy the full package.

• Your interests and skills.

Assembly language programs are by nature longer and less readable than most other computer languages. Other than programming in HEX or binary directly, (Machine code) Assembly language is about as low level as you can get. AMOS would be the easiest to learn; C is quite easy to use, but hard to learn well; followed by Assembly language. If you're interested in how a computer works, and what goes on inside it, then the latter, 68000, would be a good choice. If you simply want to produce good Amiga applications that work well on all Amigas, then your best bet is C.

AMOS is an excellent hobbyist's language, and great fun to learn and program (especially for beginners), but it is hard to produce good stand-alone professional packages with.

• Compiled or interpreted language?

If you need speed, or the ability to generate stand-alone programs you will need a compiled language rather than an interpreted language such as Basic. AMOS is interpreted, but with an add-on you can compile your programs into machine code.

Borrow some books on C and Assembler and have AMOS demonstrated to you so that you are better equipped to make a decision.

SERIOUS DEVELOPMENT

In this special trouble shooting guide, I have made many references to programs such as *Enforcer*. If you want to get hold of *Enforcer* and many, many other invaluable debugging tools straight from Commodore, write to:

Commodore Developer Support
Commodore Business Machines UK
The Switchback
Gardner Road
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Berks SL6 7XA

Enclose a cheque for £25, and ask for the "Native Developers Upgrade Kit." In return, Commodore will send you the very latest includes and autodocs (library routine information) and a directory full of handy tools and utilities which will help you to debug and test your programs more productively.

If you are seriously into developing on the Amiga, you might like to consider becoming a registered developer. There are three categories of registered Amiga developers: Registered, Certified and Commercial. Registered is the cheapest, but provides less support. Certified is in the middle, followed by Commercial, the most expensive but with the best level of support. The latter is especially designed for people producing commercial products, who need to know about new hardware and operating system versions as early as possible so that they are able to take advantage of them and ensure their existing products work. If you are interested in becoming a registered developer, or simply want information on the subject, write to the above address.

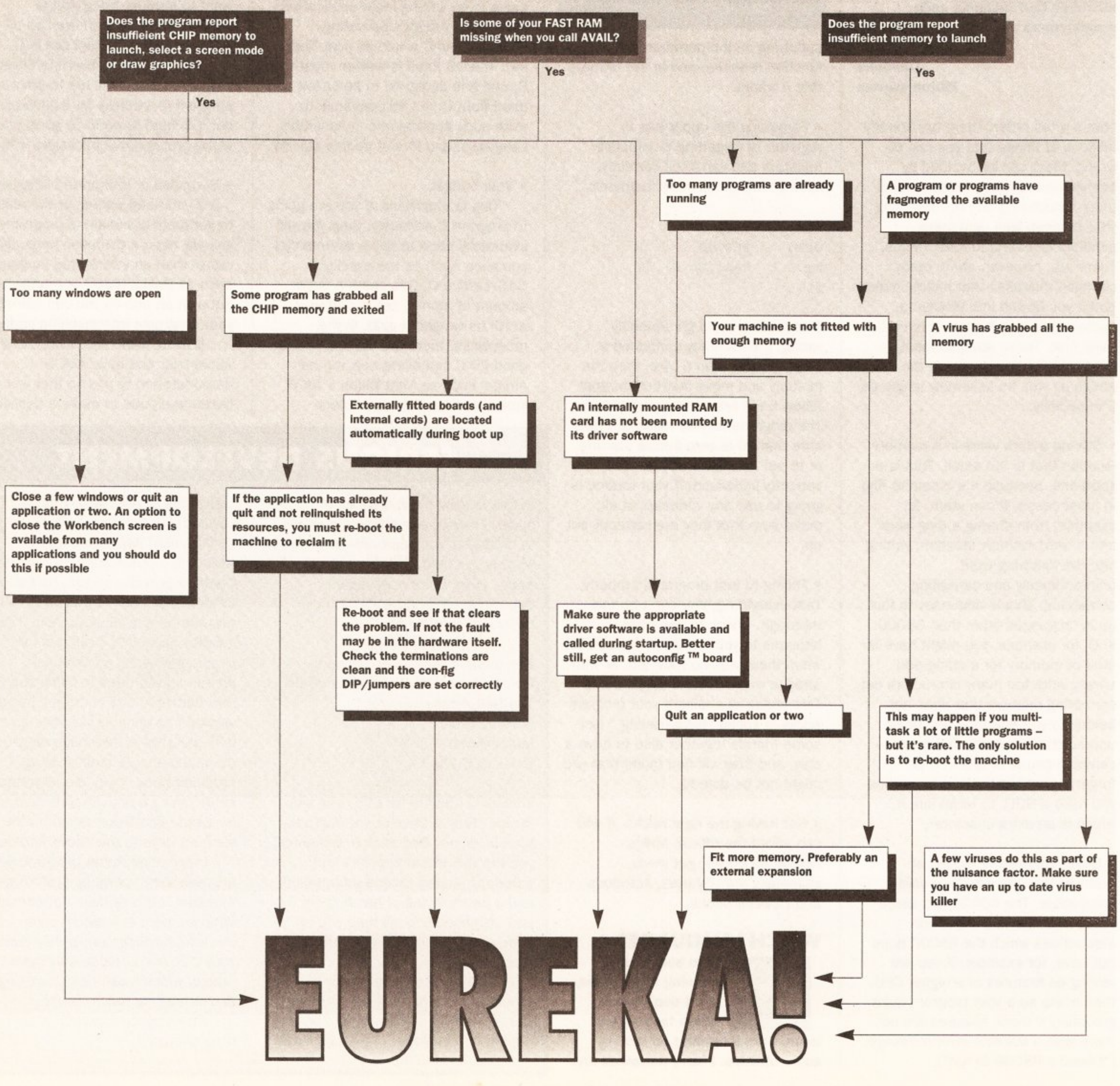
I recommend that programmers upgrade their operating system to Kickstart 2 if they have not already done so, as it is a much more powerful development environment than 1.3, and considerably more stable, which makes programming and debugging much easier.

Finally, good luck with your programming!

MEMORY...

Mark Smiddy recalls everything there is to know about memory and gives a handy guide to the Fat Agnus chip

A GUIDE THROUGH THE MEMORY MAZE



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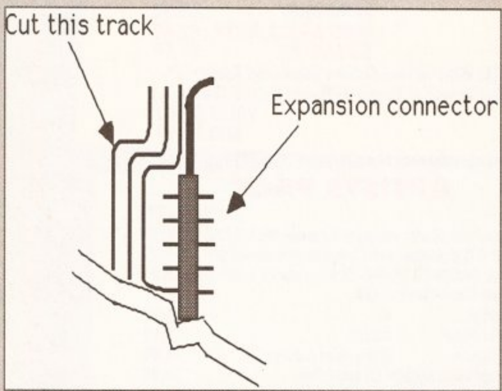
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continued from page 49

The figure you are looking for is the total amount of Chip memory available in bytes. If this is greater than 512K, the Fatter Agnus Chip is already fitted to the machine and there is no need to proceed with this.

If your machine is a recent model with 1Mb, but no Trapdoor expansion it might still have a Fat Agnus, but the board may require small changes to get 1Mb Chip. There are two ways to find out,



On revision 5 motherboards a small amount of surgery is necessary to get Agnus to see the extra RAM

either use a system information utility – most PD libraries have such things or remove the lid and take a look.

The following list of parts and tools will be required to do this job properly.

The more expensive parts like a Torx driver and PLCC extractor are not absolutely necessary, this is noted in the text:

- The 8372A Fatter Agnus
- One set of jeweller's screwdrivers
- One small crosshead screwdriver
- One small flat screwdriver
- One Torx No. 10 screwdriver
- Long-nosed pliers
- A sharp craft knife
- A small soldering iron (17W)
- A clean, earthed workbench
- An ESP wrist strap
- The lid from a coffee jar or an old tin
- About an hour totally undisturbed

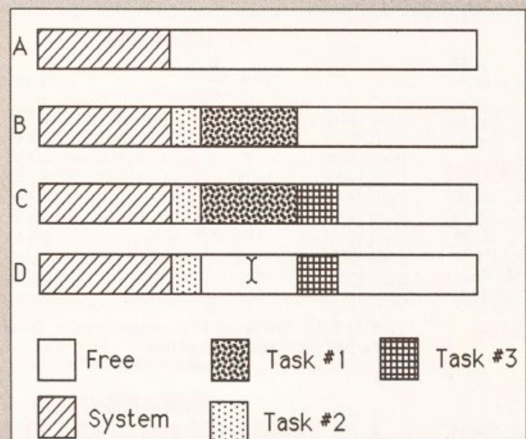
1. Switch off your machine and remove all the peripherals.
2. Place the Amiga upside down on the workbench and remove the six fixing screws – three along the back and three along the front.

These screws may be crosshead or Torx type. The Torx variety can be removed with a small flathead or jeweller's screwdriver. Be careful and do not use a normal crosshead.

Place all the screws in the tin lid so they don't get lost.
3. Gently remove the upper casing by prising it from the disk drive end. Make sure you do not snag the Escape or Enter keys – doing so will almost certainly damage the keyswitch.
4. Remove the keyboard connector by gripping the plug with pliers – do not wrench it by the cable. If the connector is stubborn try rocking it from left to right along its length.

Now place the keyboard to one side.
5. Remove the four screws securing the shield in place and lift the four lugs located around its periphery with a flatblade screwdriver – don't use a fingernail, the metal is sharp.

Remove the main and auxiliary edge connector shields and place them to one side.
6. If you have a PLCC (plastic leaded chip carrier) extractor, you can remove Agnus now. If not, you should read the instructions below detailing PCB removal. Some people advocate removing Agnus by levering it out, this can seriously damage the PLCC and they are expensive to replace. When you have removed the old Agnus, proceed at Step 16.



Memory fragmentation in action. See text for description

REMOVING THE PCB

7. Remove the 0.5Mb expansion now and place it to one side. This

continued on page 53

continued from page 49

IT'S A SIMM

My GVP Impact Series II is fitted with 4Mb RAM. I have been told I cannot expand beyond this unless I buy special chips. Is this true?

Don Butcher
Middlesborough

In a manner of speaking, yes. The GVP Series II only has space for four 1Mb or 2Mb SIMMs. If your drive is already fitted with four, 1Mb SIMMs, these will have to be replaced with the special 2Mb ones. Some suppliers may allow you to trade in the old ones, but expect to be offered as little as £8 each.

FAST OR CHIP RAM?

What is the difference between Fast and Chip memory?

Derek Dawson
East Cheam, London

For openers there is no electronic difference between Fast and Chip memory, the difference is defined by the way the Amiga uses it. Chip is found in all Amiga computers and it gets this name because the custom chips have access to it.

This memory is shared with the CPU and this can cause arguments – technically called a bus contention. When the CPU and the custom chips (Paula, Agnus and Denise) want to access the RAM, the processor has to wait for them to finish with it.

The custom chips always take priority of over the CPU. Fast RAM on the other hand is only accessed by the CPU and since it does not have to wait for something else, the CPU works faster – hence the name Fast RAM.

EXTRA PORTION OF CHIPS

Can I fit more Chip memory to my machine?

J Kaufman
Gateshead

This depends on a couple of things: how much you already have and how much your machine can take. Basic Amigas like the older A500 and A2000 machines can take up to 512K of Chip – and this is supplied with the machine.

Later A500s can be modified to take up to 1Mb Chip by adding a Fatter Agnus (part no. 8372A) and cutting a few tracks. (This procedure is described in our featuring boxout on the Fatter Agnus).

Late model A500 Plus machines and the A600 are fitted with the Super Fat Agnus and can accept up to 2Mb Chip. 1Mb is fitted to the standard machine and an extra 512K or 1Mb can be fitted in the trapdoor. Finance permitting, an extra 1Mb is a better option.

IN THE FAST LANE

How much RAM do I need? Do I need more Fast or more Chip RAM?

Elvis Jewell
Fife, Scotland

That depends on the sort of applications you want to run. Most serious applications require at least 1Mb – add another 512K to that if you use a hard disk. Most modern spreadsheets and word processing applications will work better in at least 2Mb; document processors and DTP systems realistically require at least 3Mb. With animation packages, the more memory you can afford the better – but the watershed minimum is 4Mb.

By nature of the expansions, Fast RAM tends to be more expensive than Chip and most applications gobble Chip memory at an alarming rate. Therefore, you should upgrade the Chip memory first and add Fast to that.

MORE MEMORY?

If I get a hard disk for my A500, should I get one with extra memory?

T Bear
Bridlington, E Anglia

Certainly! The throughport on many expansions for the A500 is not reliable and if you get a separate external expansion and hard disk at a later date, you may find the two are not compatible. A typical example is the Supra 500RX which seems incapable of working with the Rochard and A590 – it may work with others.

MEMORY BREAK-UP

What is memory fragmentation and what causes it?

Peter Hickman
Upminster

Fragmentation occurs mainly while the Amiga is running several user jobs at once. (Memory used by the system can and does get fragmented, but this is less likely to cause problems than user applications.)

Take a look at the diagram in the boxout – this shows four stages in a simplified fragmentation model.

a) The machine has just started. Some memory is allocated to the system tasks and the rest is (7Mb) free.

WHICH RAM?

I want to buy some RAM chips for my Amiga – what type and speed do I need? Also, if I populate the main circuit board will that give me an extra 0.5Mb?

Peter Batty
York, Yorkshire

The RAMs on the main PCB vary according the board revision. Some machines use 256K * 1-bit, later versions use 256K * 4-bit and you will need to check this first. 150nS RAM will do at a pinch but 120nS is more like it.

Adding extra RAM to the board will not affect the total amount of memory available if you already have a trapdoor type RAM expansion since this is physically mapped to the same address.

TINTED SPECS

When I am using *DPaint* I occasionally get little specs of colour in odd places. This happens on the Workbench screen too. Can you tell me what is going wrong?

Domonic Staton
Portsmouth

This sort of problem is often manifested as a dead cell or cells in one or more of the RAM chips. If it occurs on screen, the problem will almost certainly lie within one of the RAM Chips in the machine itself or the trapdoor RAM expansion. One or two pixels are nothing to worry about but they could be advanced warning of some more serious failure looming on the horizon. This problem is much more difficult to diagnose when it occurs in Fast memory and special software tools must be used.

FORGETFUL CHIPS

I've seen some RAM chips specifications quoting "Soft errors better than..." What does this mean?

Michael Simpson
Romford, Essex

RAMs are constructed from semiconductor materials, like silicon. By its very nature, silicon can contain minute amounts of radioactive elements like uranium or plutonium. Although the semiconductors used in the chips is very pure, a certain amount may remain.

When the radioactive elements decay they give off particles, which in turn can cause memory cells to forget – literally! This sort of failure is extremely rare and can be fixed by the inevitable re-boot.

SHORT MEMORY

Why can the Amiga only take 9Mb of memory in total when the 68000 is capable of addressing 16Mb?

Mark Hamilton
The Wirral, Lancs

It all comes down to the machine's design. The 68000 has a 24-bit address bus which gives just over 16 million unique addresses. However, some of the possible address space is occupied by other things such as the ROMs, PAD, memory mapped peripherals and the Autoconfig™ system.

Machines like the A500 Plus are fitted with Super Fat Agnus chips and can address 10Mb in total. If your software is really memory hungry you should upgrade to a bigger processor such as a 68030 which can access considerably more RAM and do so a lot faster.

SIMMS, ZIPS AND DIPS

Could you please explain the difference between SIMMs, ZIPs and DIPs?

John Walker
Liverpool

These terms refer to the type of package use to house the memory chip. DIPs – dual in-line packages – are the oldest variety.

DIPs are still widely available in 256K and 1Mb packages and found mostly in trapdoor RAM expansions; but they can also be found in the A590.

ZIPs are a more modern version with a higher capacity but are rarely seen and hard to locate. Supra's 500Rx for the A500 uses ZIPs. SIMMs (simultaneous In-line memory modules) are the easiest to use – they are just a set of pre-mounted SMT (surface mounted) DIPs on a custom-made PCB. SIMMs are by far the easiest type of memory to fit – so simple that even a child could do it.

REMEMBER THE A1000

My trusty old A1000 only has 512K fitted – does anyone still make an expansion for it or will I have to replace it with a new machine?

Graham Taylor
South Humberside

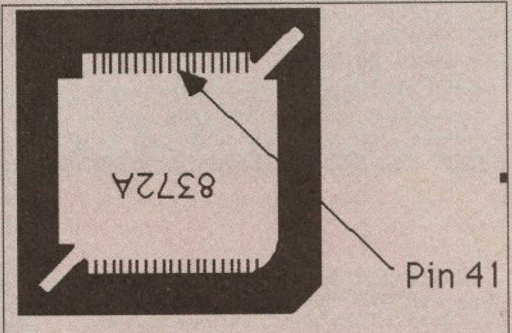
Since Commodore ceased supporting the A1000, developers have left it in their droves. However, you can still get a serviceable 0-8Mb expansion from Cortex on 051-236 0480.

continued on page 52

WHAT IS THE FAT AGNUS?

One of the most common queries about memory concerns the nature of the Fat Agnus chip – here's the ultimate answer...

Fat Agnus is one of the Amiga's custom chips and is responsible for the handling of graphics memory among other jobs. Basic 1Mb machines come with 512K of Chip and 512K Fast RAM but by replacing the Agnus chip with an upgraded version you can increase the available Chip memory to the full 1Mb.



Agnus – as it is positioned looking from the front of the machine (upside down). This shows clearly the location of pin 41, the ninth pin in from the right

UPPING YOUR MEMORY

This modification is not for the faint-hearted and will only work with A501-type 512K memory expansion cards – including the KCS Power PC card. If your expansion is not one of these the modification may be supported by the card – check with your supplier first.

Before starting this modification you should first check if you already have the Fatter Agnus installed and working. To do this open a Shell and enter:

```
AVAIL
```

continued on page 52

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Agnus – The custom chip dedicated to graphics. Earlier versions could access 0.5Mb of memory. Later versions (as used in the A500 Plus) can access 1Mb, while the latest can access 2Mb.

Bit – The smallest unit of memory. A bit can have a value of either 1 or 0.

Byte – A byte is a collection of 8 bits, capable of storing values between 0 and 255.

Chip RAM – The area of the Amiga's memory directly accessible by the custom graphics and sound chips.

Contiguous – All in one lump. The Amiga loads programs anywhere into its available memory. If it begins with 1Mb and loads in a short program, this may well end up somewhere in the middle of memory, meaning that the available contiguous memory has suddenly been halved.

Fast RAM – Any memory that is not Chip RAM. The custom chips cannot access it, and because such accesses to Chip RAM can block out the central processor and slow down its own accesses, Fast RAM is faster.

Kb – A kilobyte is 1024 bytes of memory.

RAM – Random Access Memory stores programs and data electronically whilst they are in use. RAM's contents are lost on power-down.

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b) Two tasks (applications) have been launched. Let's say, a spreadsheet (1Mb) and a word publisher (3Mb).

c) A third task, let's say a database (1Mb) is started.

d) The word publisher is exited and the memory it used (3Mb) is given back to the free "pool" – but its position in the map cannot change, therefore the free memory has been divided into two large chunks.

Although the total free memory could be as much as 5Mb, this might be divided (fragmented) into two parts, say 2Mb and 3Mb. In other words, although 5Mb memory is available the largest block is just 3Mb. You can check this with the system command, AVAIL.

In practice this type of fragmentation is happening all the time but larger memory configurations are less likely to suffer from it.

Disks incidentally suffer from exactly the same fragmentation problem, but AmigaDOS handles the problem differently.

WHAT'S DMA?

What is DMA and why is it used so extensively?

Paul Carvill
Harrow

DMA simply means Direct Memory Addressing. Like many computer terms, DMA is a little vague. It simply means some chip other than the CPU has direct access to the machine's RAM.

DMA operations are usually performed while the CPU is doing something else – actually executing instructions and this can make the machine operate faster.

It is commonplace to assume a CPU is constantly accessing RAM while a program runs, but this is not the case for most processors. In practice, the machine performs a something called the fetch-execute cycle. In simple terms, this means it gets a series of bytes from memory and assembles them into an instruction – during this time it has control of the data and address buses.

As the instruction is executed, the CPU relinquishes bus control and lets other chips have access to it. In fact, it's a little more involved than that, but such discussions are beyond the scope of this feature.

ELEPHANTS NEVER...

Why can I never remember my wife's birthday?

David Laurence
Cirencester

You need is something like The Pest appointment scheduler or a decent calendar. Both these have been published in recent instalments of *Amiga Shopper*'s AmigaDOS series.

PC RAM IN AN AMIGA

I recently purchased a 4Mb memory expansion for a Compaq computer. Obviously this was not suitable for the Amiga, but I was hoping I could transfer the chips to an Amiga expansion board. The board is populated with these chips: TC511000AP-10. If these chips can be utilised, could you please recommend a suitable expansion board?

C Slater
Troon
Ayrshire

The chips on the board are 1Mb x 1 100ns chips. In theory these can be used; most Amiga 2000 cards use 1Mb x 1 chips. However there are a few problems...

First, recent Compaq memory cards use surface mounted memory chips. These look like small square blocks with pins on each side, soldered directly to the circuit board. These are not removable and can't be used with the Amiga. If the chips are socketed they are likely to be one of two types: DIP type are standard chip-shape with a row of pins along each side; ZIP are newer chips which stand side-on with all the pins along one edge.

The only board I know of for the Amiga that will take 1Mb x 1 DIP chips is the Spirit X-RAM expansion, although I don't know of anyone who is still supplying this.

As for ZIP chips, I haven't found anything that will use 1Mb x 1 ZIPs. All the expansions using ZIP chips take the 256 x 4 ZIP instead.

WHAT ARE RAM DISKS?

I'm a little confused over the term RAM disk. Please could you explain it to me?

D Aston
Glasgow

A RAM disk is a special kind of 'imaginary' disk drive. You may have noticed that floppies can be slow – the RAM disk is a way round this. An area of the Amiga's memory is set apart from the rest and treated as if it were a disk drive. When a file is loaded from the RAM disk, the information is copied from that part of RAM to the Amiga's normal memory where it can be used as normal. Remember, though, that when the machine is reset, everything will be lost.

continued from page 52

isn't absolutely necessary but it will help avoid strain when the PCB is removed.

8. Remove the disk drive's power and IDC connectors from the PCB.

The IDC will be quite stiff, and might need gentle leverage with a fine flat-blade screwdriver.

9. Lift the machine on its edge and remove the three screws in forming an "L" shape located near the disk drive. Hold the drive firmly while you do this.

10. Looking at the disk drive from the front of the machine you will see a single fixing screw on a pillar. Loosen, but do not remove this and you will be able to remove the drive entirely.

11. Looking from the front of the machine, locate the PCB securing lug. This is a small plastic catch about five inches in from the left of the case.

Insert a flat blade screwdriver in the slot underneath the case and push the lug towards you. Now, very carefully lift the PCB out of the case and put the other half to one side.

12. Remove the 12 nuts securing the peripheral sockets to the shield. You should do this with a jeweller's spanner or a very small socket, but a pair of pliers will suffice.

If you must use pliers, take care not to damage the four male connectors: RGB, Serial, Joystick and Mouse.

13. Remove the lower shield from the PCB and place it aside.

14. Underneath the PCB you will see two small holes surrounded by a square of solder pads. This is the underneath of the Agnus PLCC.

You should be able to push a pair of long-nosed pliers or a couple of small dowel pegs into the holes and pop Agnus from its socket.

15. Replace the bottom shield and replace screw the nuts back in place.

Now replace the PCB back in the plastic case bottom and snap it into place.

FIXING FAT AGNUS

16. Your new Fat Agnus chip will have been supplied in foil wrapper, remove that and study it for a moment – be careful not to touch the pins more than you need to. One of the pins, 41 actually, may well be missing or bent back. If this is the case, the Agnus has been supplied ready modified for the UK market; if not, it has to be isolated.

Leaving pin 41 in place is not a problem, but it will leave your machine stuck in NTSC (200 line) mode as opposed to the 256 lines available with the PAL system.

Check the Agnus for fit in the socket and using the first illustration for guidance, isolate pin 41.

Counting in from the right, pin 41 is the ninth one. Bend it back and wrap a small piece of insulating tape around it.

Do not cut it off – if you cut the wrong pin, the whole chip will have to be replaced. Now push the Agnus chip firmly home and wipe your brow.

> **"You don't need to make a 1/5 scale model of the Cheddar Gorge – just a little nick."**

MODIFYING THE BOARD

17. Next job is to locate jumper JP2. It's a trace of solder between three pads and clearly marked on board revisions from 5 upwards, located near the CPU.

If you have a CPU mounted RAM expansion, AT-Once or similar you will have to remove that first to gain access. Using a knife make a small incision through the jumper and solder the other two pads together.

18. If you have a revision 5 PCB the next part is tricky.

Study the second diagram and locate the four tracks running near to the top edge of the trapdoor expansion connector. You can identify the right one because it terminates in a blob of solder opposite the eighth pin-pair on the expansion connector (counting down). Make a small nick in that track being careful not to damage any others; each one is less that a millimetre wide and a fraction of that thick!

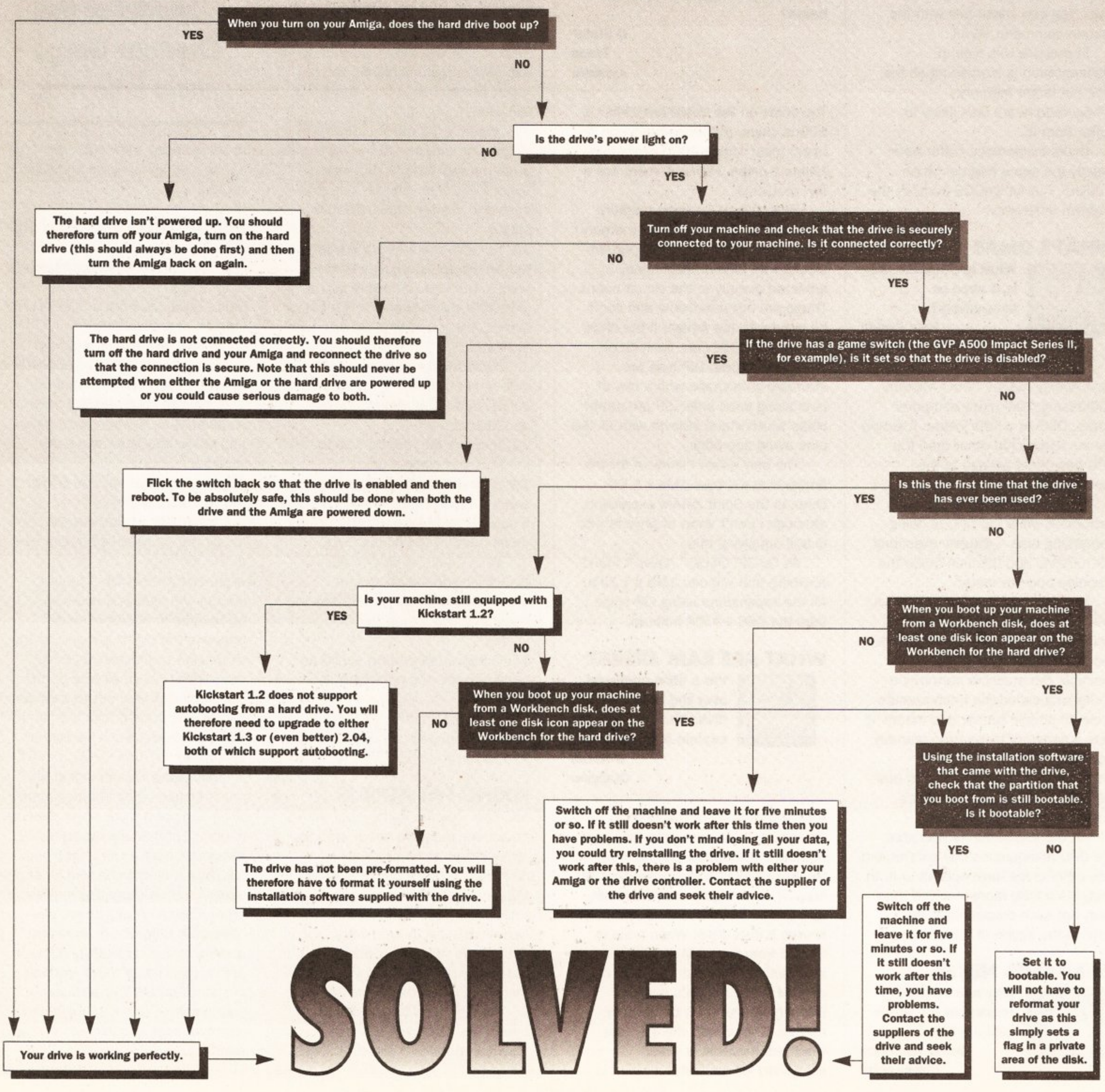
Revisions 6A and higher are much simpler. Just locate jumper JP7A and cut it – you don't need to make a 1/5th scale model of the Cheddar Gorge – just a little nick.

19. That's all there is to it. Just put everything back together in reverse order, switch on and check you have 1Mb Chip. It's important to disable programs like NoPalReset just in case you haven't isolated pin 41 correctly. This will cause your machine to constantly reset during re-boot and this can be quite alarming.

HARD DRIVES...

Jason Holborn gets to grips with your hard drive problems and suggests a few pointers to keep your drive on its feet

ON THE ROAD TO NO MORE HARD DRIVE HASSLES



GVP BOOT PROBLEMS

I am having problems with my GVP Series 2 A500 hard drive that I bought in the spring of this year (it is therefore still under guarantee). I have found that it has started to produce a lot of read/write errors even after formatting it and restoring its contents from an Archive Viper Tape Streamer.

I have found that it will often not boot up at all after using the game switch (the children use the Amiga for games) therefore forcing me to use the GVP binddrivers and a Workbench boot disk to access the drive. Sometimes I even have to resort to booting up under 2.04 to get the drive to work (my machine is equipped with a ROM sharer although I still use 1.3 most of the time).

I have also noticed that the power supply for the GVP drive gets very hot and the speed of the fan inside the drive seems to fluctuate. Could this be the problem?

Michael Reynolds
Holsworthy

My guess would be that your GVP power supply is causing the problem. If the cooling fan inside the drive is fluctuating in speed, then it seems pretty obvious that the drive is not being fed a consistent supply of power.

This would definitely cause the drive to fill with read/write errors as the inconsistent power supply is interrupting the drive while the Amiga is trying to access it. It's a bit like turning the drive on and off rapidly while the Amiga is reading or writing a file to the drive. If you've ever been stupid enough to try this with a hard drive (which I hope you haven't) then you'll know all too well that the drive doesn't continue working for very long. A dodgy power supply will produce a similar result.

My advice to you would be to pack up your hard drive (and power supply) and send the lot back to Silica explaining the problem and the solution that I've suggested.

All GVP drives have a 2 year guarantee so I'm quite sure Silica will be more than happy to sort it out for you.

BY THE SEA(GATE)

I was recently given a Seagate Technology 14.8 Mb hard drive Model ST-419.

Do you know if it would be possible to connect and use this drive with my Amiga?

DJ Appleby
British Forces
Germany

To be perfectly honest, the Seagate drive that you have been given is about as useful as a hair dryer in a hurricane. These rather geriatric drives are complex beasts that are difficult to set up and rather slow in operation. Anyway, what's the point in having a 14.8Mb hard drive?

15Mb may sound like a lot of storage space now, but you'd be amazed just how quickly it would fill up! Do yourself a favour and buy a decent SCSI drive (the GVP Impact Series 2 is a goodie). As for the Seagate – well, I've been told that they make lovely paper weights!

GETTING YOUR BACKUP

Being something of a beginner to this computing lark, I'd like to ask your advice concerning the purchase of a hard drive for my 1.3-based A500 (I bought the machine second-hand). I use my Amiga mainly for sampling and music composition so as a result I need a hard drive to store all my samples and songs. So far I've got about 10 disks filled with samples which I intend to transfer to hard disk. Which drive would you recommend? I understand that the GVP drive is a very good choice but I'm not sure whether to buy the 52Mb drive or to spend out a bit extra and have the higher capacity 110Mb drive. Will I really need 110Mb of storage?

A PC-owning friend tells me that it is very important to back up a hard drive every so often to prevent from losing all your files in the event of a hard disk failure. He uses a program called *FlexiBack* on the PC. Is this available for the Amiga? If it isn't, which Amiga backup utility would you recommend?

John Holmes
Doncaster

Deciding upon what size of hard drive to purchase is a little like trying to decide how much RAM you need inside your machine. Although the drive capacity that you eventually choose may seem more than adequate for your needs, you can bet that you'll eventually wish you had bought a larger drive.

The first drive I ever bought was a 20Mb A590 which I used to run on my old A1000. Back then 20Mb sounded like a lot, but after transferring all my favourite programs on to the drive, I wasn't left with a lot of space to play around with (I had about 1.5Mb left!). When I treated myself to a B2000, I moved up in the world and treated myself to a 40Mb Quantum SCSI drive. Once again, 40Mb sounded like a lot, but it too was soon filled. After little more than a couple of months, I traded the Quantum in for a 90Mb Fujitsu SCSI drive and guess what? Yep, the bl**dy thing was filled within 2 months!

The moral of this story is simple – although 52Mb may sound like one heck of a lot of hard disk space, it'll fill up faster than you could possibly imagine. If you can afford it, go for at least 100Mb.

My personal choice in hard drive for the A500 is the GVP Impact Series 2. GVP makes some cracking bits of kit and the Impact Series 2 drive is certainly no exception. As you state, it's available in 52 and 110Mb form with space for up to 8Mb of RAM on board. They're also jolly fast, so you'll never be left waiting for your favourite sequencer to load.

FlexiBack is actually a shareware program for the PC so it should come as no surprise to you to learn that it is not available on the Amiga (very few PC titles are). If you're after a hard disk backup program (and I would recommend you use one) then you won't go far wrong with *QuarterBack* from Central Coast Software. The latest release (version 6.0 I think) is available from HB Marketing on 0753 686000.

NO ADVANTAGE?

Having treated myself to an ICD Advantage 2000 controller and 40Mb Quantum drive for my Amiga 2000 late last year, I've noticed a distinct decrease in the drive's performance. When I first bought the drive, it positively rattled along but these days it seems to take an absolute age just to display the contents of the root directory. Is the drive worn out?

C Boothe
Trowbridge
Wiltshire

You'll be pleased to learn that there's actually nothing wrong with your hard drive whatsoever. Judging by the symptoms that you've described, it sounds to me that your drive is simply suffering from a case of disk fragmentation, a problem which plagues all hard drives eventually.

Like a floppy disk, files on a hard disk aren't stored one after another on the disk's surface. As you delete and add new files, the drive's

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Tape Streamer – A hardware device which is used to back up high capacity hard drives. Cheaper versions use tapes similar to conventional audio tapes although the magnetic tape they use is of a much higher quality.

SCSI – 'Small Computer Systems Interface'. SCSI is an industry standard connector which enables your Amiga to talk to SCSI-compatible devices including hard drives, tape streamers, CDROM drives and scanners etc.

RDB – 'Rigid Disk Block'. The common name for the format used by Amiga hard drives. Any controller that supports RDB can use a drive formatted under the RDB standard regardless of what make of controller it was originally formatted with.

AT IDE – Similar to SCSI, AT IDE is another type of interface used to connect a hard drive to the Amiga. The hard drive inside the new A600HD is an AT IDE drive. Although AT IDE and SCSI offer similar speeds of operation, SCSI is more flexible.

Fragmentation – The more you use a hard drive, the more it will appear to slow down. As the drive fills up, it may not be possible for the Amiga to store the file in one big lump on the drive. Instead, it will split the file into 'fragments' which are stored in whatever space is available. When the Amiga tries to load this file, it has to hop about, piecing these fragments together causing a decrease in drive performance. This speed decrease is caused by disk fragmentation.

Partition – Most hard drives allow you to split them into two or more sections called partitions. As far as the Amiga is concerned, each partition is a hard drive in its own right. Partitioning is a good practice as it gives better data security and makes your drive more organised.

Head Parking – Parking a hard drive forces the drive mechanism to move the head (the part that reads the information from the magnetic disks) away from the disk surface. This ensures that the head does not come into contact with the disk causing what is called a 'head crash'.

Library files – A file containing a collection of routines that can be called by external programs to carry out particular operations.

contents can be spread across the disk in quite a seemingly untidy manner. After a while, the free space on the drive may become so scattered that it may not be possible to store a larger file as one big file on the disk.

To get around this, the Amiga splits the file into 'fragments' which are then stored separately on the disk (as far as the user is concerned, a fragmented file still appears to be stored as one file). When the Amiga loads a fragmented file, the drive head has to hop about the drive reading in several different files to form the single file that you originally saved (all this is performed automatically of course!).

All this hopping around obviously affects the performance of your drive. Thankfully it is possible to reconstruct the structure of a hard drive so that files are not fragmented using a software utility such as Central Coast's *QuarterBack Tools*. You'll have to back up your drive first, but defragmenting a drive can speed it up considerably. *QuarterBack Tools* is available from HB Marketing on 0753 686000.

THE GREAT DIVIDE

I recently bought a GVP hard drive for my Amiga 1500 and I'm very pleased with it. As soon as it was installed inside my machine, I set about copying all my favourite software on to it – I now have a drive which contains *ProPage 3.0* (plus about 200 fonts), *DPaint 4*, *ProDraw 2* and a massive amount of work files. Problem is though, it's all starting to get a little messy.

Looking back, I know now that what I should have done is to have split the drive (it's a 105Mb Quantum drive by the way) into three partitions – one for Workbench 2.04, one for all my programs and another for my files. I've been told that the only way to partition a drive is to reformat it. Is this true?

I have to admit that I'm a bit lazy and therefore I can't really be bothered to back up 105Mb of data on to floppy disk and then have to install the whole thing from scratch.

I'm hoping for a miracle here, but is there possibly a method of partitioning a drive without having to faff about with *Quarterback*?

Steve Turnipp
Glasgow

Sorry Steve, but modern technology has no miracle solution for us lazy people. I'd like to restructure my hard drive too, but I too am faced with the daunting prospect of backing up a huge hard drive. I'm afraid the only way to change the structure of a hard drive is to reformat it.

In your particular case, you don't necessarily have to back up the entire drive. Even if you do, you may find that you can't restore the files that you have backed up 'en masse' once the drive has been partitioned (don't forget, each partition is treated as a separate drive by the Amiga).

Providing that you've got all your programs stored on floppy disk, all you would have to back up is your work files.

Make sure though that the partition you create to hold these files is large enough though – most backup programs simply stream out the files as one huge binary file that is split across several disks.

Once the drive is partitioned, you can then reinstall all your programs separately and therefore customise their placement on the drive to suit your needs. This way you get a chance to rethink not only the organisation of the drive partitions, but also the contents of each partition (DTP software in a separate directory from music programs, for example).

Restructuring a hard drive is just the thing to while away a boring Sunday afternoon (who knows, maybe even I will get around to doing it one day!).

TOWER POWER

After years of drooling over the specification of the Amiga 3000, I've finally taken the plunge and upgraded from my aged B2000 to a spanking new 25MHz A3000T. Problem is though, the A3000 has its own 100Mb hard drive and (as a result) I've got a spare drive which is filled up with all my favourite software and is organised just how I want it. Is it possible to connect the drive to the 3000T and transfer the contents across onto the 3000T's internal drive? Will the 3000T be able to read the drive (it was formatted using a GVP controller)?

Paul Simpson
Norwich

Thanks to the wonders of the Amiga's RDB (Rigid Disk Block) format for hard drives, I see no reason whatsoever why you should have any problems connecting the drive to the 3000T through its SCSI connector (you'll still need a power supply for the drive though).

If you fancy extending the storage capacity of your new machine, you could even leave the drive attached and use it as just another partition. If you'd like some help with this, send me the 3000T and I'd be more than happy to do the job for you (just don't expect to get it back!). Joking aside though, it's a fairly simple task.

VIRUS ALERT!

With so many viruses now plaguing the Amiga, is it possible for any of them to infect a hard drive? I've got a 180Mb drive connected to an Amiga 3000 (which I use for my work) but my children also use the machine for playing games. They'd crucify me if I stopped them from using the machine, but equally I need to be sure that the drive won't be infected by any viruses.

What options are there available to me?

Don Jones
Newcastle-Upon-Tyne

The vast majority of the viruses that are currently doing the rounds on the Amiga are what are called 'bootblock' viruses. That is, they live in the boot block of a disk. Hard drives don't have boot blocks, so it's impossible for a conventional boot block virus to infect a hard disk.

That's not to say that hard disk owners are completely safe though – far from it. It is still possible for a

CARE FOR YOUR HARD DRIVE

As long as you follow a few simple guidelines though, most hard drives will perform virtually problem-free for years. Here's a rundown of the sort of precautions you can take to keep your hard disk in tip top condition.

1. If your hard drive has an external power supply, always turn the drive on before you power up. Even then, it's best to pause for a few seconds before turning on so the drive has time to settle.

2. *Never* turn the hard drive or your Amiga off whilst the Amiga is accessing the drive. You must always wait until disk activity has ceased before powering down. Once again, the hard drive should be powered down before the Amiga.

3. Better still, get into the habit of parking the drive's heads before turning either the drive or the Amiga off. Although most modern SCSI drives feature auto-head parking, parking the heads manually is a very good habit to pick up.

4. Back up your hard drive on a regular basis. I know, backing up even a 40Mb hard drive is very boring, but you've only got yourself to blame if a problem does occur and you lose all your data. If you use the Amiga professionally, it may even be worth your while investing in a tape streamer.

5. Keep the drive away from any source of vibration. Although hard drives are quite robust, it doesn't take much to cause the drive to suffer a head crash. You should therefore never put your system too near loud speakers, spin dryers (you may laugh, but people do the strangest things!) or any surface that can be knocked about by clumsy pets, children, etc.

6. Always keep the Amiga and the hard drive well ventilated. You should therefore never pile books and magazines on top of either for long periods of time. Most external hard drives have cooling fans – if this is covered up by a clumsily placed pile of disks or magazines, then you're asking for trouble. Overheating can cause serious damage to most forms of electrical equipment.

OK, so you've followed all these guidelines but eventually something does go wrong. Well, over these four pages we'll be sorting out a few of the more common problems that plague hard disk owners. If your letter isn't published, then flick through all the questions and the chances are that there is someone out there who has exactly the same problem as you. With the advice that we've provided, most hard drive problems can be sorted out without having to contact the manufacturer.

If the worst comes to the worst however, don't forget that most hard drive suppliers operate some form of technical helpline. If you're still stumped after reading our trouble shooting guide (we'll be surprised if you are, though), why not contact the suppliers and seek their advice. Don't get stroppy with them though – suppliers are far more open and willing to help if you speak nicely to them.

hard disk to be infected by what are known as 'parasite' and 'trojan horse' viruses.

Parasite viruses work by attaching themselves to certain files (usually important system files) whilst Trojan Horse viruses are viruses that are 'hard coded' into a program by an unscrupulous programmer.

Thankfully very few of these viruses exist so the risk of catching a virus on your hard disk is reduced somewhat. It's still worth installing a decent virus killer on your system though – I personally recommend John Veldthuis' *Virus Checker 6.1* which can trap just about any form of virus. Have a chat with your local PD library and I'm sure they'll be able to supply you with the appropriate Fish disk.

Another point in your favour is the fact that your system is running Workbench 2.04. Most virus programs are sloppily written so although they worked under Workbench 1.3 (only just though!), the vast majority of them die completely when they encounter 2.04. This won't always be the case though – virus programmers probably have 2.04 as well now!

Take my advice – arm yourself with a copy of *Virus Checker* and update it every time John releases a new version.

PARKING SPACE

I have recently bought a second-hand ICD AdSCSI controller and 52Mb drive for my Amiga 2000 but one thing concerns me.

I've read in numerous articles that the vast majority of modern SCSI drives offer automatic head parking as standard.

Presumably the Quantum drive that I have also has this feature but the software that comes with the AdSCSI includes a park program that the manual insists should always be run before switching off the machine.

Unfortunately I don't have this park program and I've been forced to turn the machine off without first parking the drive. Is this safe? Should I try and obtain a copy of the parking program before it's too late? If so, where can I obtain it? Your help would be much appreciated.

Peter Holbron
Wells
Somerset

Software head parking utilities are strange beasts. Whilst they are technically not needed with a drive that offers auto-head parking, I believe it is still a good idea to use a park program just in case something should go wrong when you turn off your Amiga.

All Quantum SCSI drives support auto head parking (you should hear an audible 'click' when the machine is turned off – this is the drive parking itself) so it's entirely up to you whether you use a park program or not.

As I said, technically, you shouldn't need it, but you'll sleep a lot better if you know that the head has definitely been parked (especially if you move your machine from one place to another). I would never turn off my machine without manually parking the drive first. Check out the box on page 56 for some tips on looking after your hard drive.

600 QUESTION

I have an Amiga 600HD with a 20Mb internal hard disk. The A600 is the first computer that I have ever owned and I find the hard disk very useful indeed. Unfortunately my understanding of the A600 is not quite on a par with my enthusiasm, so I'd like your advice.

I've just purchased my first Fred Fish PD disks which contain a number of utilities that I'd like to install on my hard drive (isn't Amiga PD great?). I've tried copying them across simply by dragging icons, but a couple of the programs don't work when run from the A600's drive.

Is there a problem with my machine or am I just a little bit thick?

If you could provide me with a few pointers on how to install software from floppy to hard disk it would be a great help.

Philip Vanner
Nuneaton

You've stumbled across a problem that all new hard disk owners have to face eventually. Whilst some programs can be copied on to a hard disk simply by dragging them across via the Workbench, there are others that rely on extra 'invisible' files that can't be copied in this manner unless you know where to look.

If you encounter a program which stubbornly refuses to work once transferred, then copy the drawer in which it lives rather than just the single icon which you see on your Workbench. This usually works if the program accesses data files such as pictures that are stored in the same drawer but don't have their own icons. If you feel slightly more adventurous, why not display the contents of the entire directory using the Workbench 'Show All Files' option in the Window menu? This instructs Workbench to create icons for any files that don't already have them. Once again though, you need to know exactly which files the program needs, so the first option may be a better bet if you're not too sure.

If this fails to work, read the documentation included with the program to see if it needs certain system files transferred.

Many programs use their own library files which must be transferred for the program to work. If it does, then copy these across on to the appropriate system directories on your hard drive and the program should work. Check also that the program doesn't require access to its own custom font. If it does, copy this across too.

All this copying sounds pretty complicated, doesn't it! Well, my advice to anyone who has just bought themselves a hard drive but can't face the thought of learning AmigaDOS is to invest in a decent directory utility such as INOVAtronics' absolutely amazing *Directory Opus.*

Directory utilities are a real boon for hard disk users as they enable you to move around the directories of a hard disk performing all sorts of house keeping chores such as copying, deleting, renaming and even a spot of hoovering (only joking).

It's about time more PD programmers started to think about hard disk users. Virtually all commercial applications software packages include hard disk installation utilities these days, so it's about time PD programmers followed suite. Life would be so much easier for everyone involved.

USING A MAC HARD DISK

I have been given the option to purchase a 20Mb Macintosh and hard drive fairly cheaply. Is there any way that I can connect it to my Amiga 500?

If it is possible to connect it, will there be any problems with autobooting and software compatibility?

J O'Shea
Killarney
N Ireland

Macintosh drives use the standard SCSI interface, so, yes, you can connect it. You will need to purchase a hard drive interface for your Amiga 500. One of the cheapest is the DataFlyer, but any SCSI interface for the Amiga will work.

As long as you are working with Kickstart 1.3, you will have no problems with autobooting. You shouldn't have any special problems with software either. Some software will refuse to work with any hard disk, but that's because the software was badly written and won't be the fault of your new hardware.

HARD DRIVE HARD TIMES

I bought a second-hand GVP Impact 500. I put in a MiniScribe 20Mb drive and it worked fine.

The trouble is that when I add 2Mb of memory in the sockets provided it seems to clash with the internal memory which is a 1.5Mb expansion board from Power Computing.

I have put the drive on a bog-standard A500 and the same fault appears. I have also changed the power supply to the hard drive, but the fault persists. The memory chips have been changed four times without result.

Help!

T Cooper
Trowbridge

If your memory fails to work on a bog-standard A500 and you've changeddthe RAM and the PSU, then I'd have to say that your GVP Impact 500 unit is probably faulty.

The circuitry that handles the SCSI drive and the circuitry that handles the memory are mostly separate, so it is quite conceivable that the SCSI drive will work fine, but the memory fails.

NOT SO QUIET DRIVE

I purchased a QTEC external drive, model EX-310 about 7 months ago. Although the drive is very reliable, it makes a very loud whirring sound while accessing disks.

It didn't bother me until I saw an advert for the drive, stating that it was very quiet. Is there any way of replacing the motor drive?

I have also noticed that with the large majority of games, if a disk is left in the external drive the motor spins continually. Is this normal?

Simon Gray
Easton
Bristol

The QTEC EX-310 is indeed a very quiet and reliable mechanism, so I imagine that there is a problem with yours.

It is not so much the loud whirring that bothers me, because one man's loud whirring can be another man's gentle whisper.

The problem is that the drive light should not remain on for longer than a few seconds after disk activity has ceased. What you ought to do, is get a reputable dealer to check it over to see what the problem is.

Whatever you do, don't get involved with replacing drive motors – you are definitely asking for trouble if you attempt this.

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This brand new, Dataflyer Hard Drive Interface is intended to outperform all current Amiga 500 & 500 Plus Hard Drive Interfaces. Simply fit your Scsi or Ide hard drive unit into the case, (mounting hardware supplied), load the Autoinstall software, follow the step by step on screen instructions, & within minutes, your Fast & Powerful Dataflyer Express will be ready to use. Both Ide & SCSI types can be upgraded to combined IDE/SCSI dual interface.

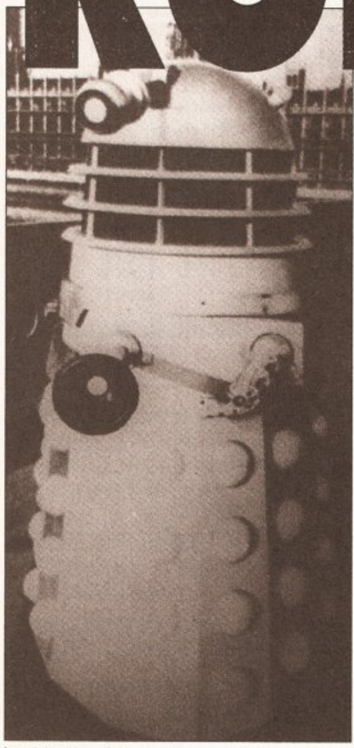
DATAFLYER EXPRESS (IDE VERSION)	£149.99
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DATAFLYER EXPRESS IDE & SCSI VERSION	£169.99
1 MEG SIMMS 2,4,6, OR 8 REQUIRED	£24.99
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* DEPENDING UPON VERSION - three versions are available - IDE ONLY, SCSI ONLY, or dual IDE/SCSI. Ide or Scsi versions are user upgradable to dual type.

ORDERS FROM PLCs, LOCAL GOVERNMENT & EDUCATIONAL ESTABLISHMENTS WELCOME.

This month sees Wilf Rees taking a second look at using your Amiga to exert control, and talking to a friendly alien called ADI

ROBOSHOP 2



Is this the future shape of your Amiga? It could be...

Last month I looked at how we can use the external ports of the Amiga to begin controlling assorted devices. To rationalise the understanding of control, I have based all my experiments on the Switchsoft I/O port, and its associated accessories. I aim to continue the same path this month, with a look at more sophisticated applications to give advice on how you can develop your understanding of 'control', and work towards more advanced applications.

ROBO SPEAK

First, a few words about robotics. The word robot was first penned in the 1920s in a play by the Czech writer Karel Capek. It was about a scientist who built machines called 'robots' from the Czech word 'robota' meaning slave-like work. Unfortunately, at the end of this play, the robots kill their human creators to take over the world!

The potential of computers makes it likely that more and more jobs will become automated in the future, so an understanding of robotics is a valuable asset.

Controlling any device from a computer requires commands, and these can be sent in various forms. Last month, I explained how most of the Basic languages are supported by the Switchsoft port, and I will be continuing in this format. The basic principle is that the computer can make decisions on when to turn on motors, and for how long. The Amiga can also base those decisions on information it receives from sensors.

BUILD YOUR OWN

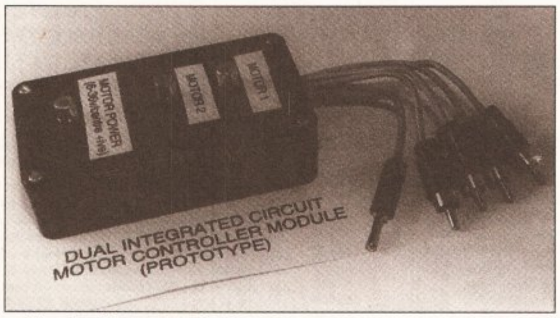
The mobile robot can vary in size. Generally, the smaller ones are called buggies, and are attached to the computer by an umbilical cable. Some have on-board computers much smaller than Amigas! Personal computers like the Amiga have made robot building much easier. In the early days of robotics, the only way to implement decision-making ability by the robot, was by using electronic components. Now all the control algorithms can be implemented by software on a disk.

An Amiga-based walking android is a little ambitious to start with. At this stage, you don't need to incorporate the Amiga on-board. Start off with an umbilical connection, but maybe leave space for the Amiga for later developments.

Decide on the size and shape of your robot and which materials to use for construction. Plywood might sound low-tech, but it's one of the best materials to use.

The best shape for a robot is cylindrical. The reason for this is that a very tight turning circle is a great advantage. If the robot encounters an obstacle, it can reverse and turn virtually on the spot to change direction. When turning, you don't want one of the corners to knock over your mum's prize Ming vase, or knock lumps out of an unsuspecting dozing dog.

It is of course rather difficult to produce a circle in plywood, so a hexagonal cross section is a good compromise, something like a Dalek, in fact. You should allow for computer, battery, wheels and extra sensory circuitry. One of the sides should incorporate a hinged door.



The dual integrated circuit motor controller module will make future building and driving of robots easier

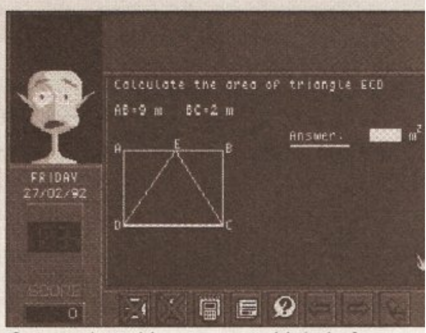
WHEELIES AND CATERPILLARS

Having designed the general shape of the robot, you need to think about mobility. There are many possibilities for producing movement. You can use wheels or tracks. You might consider legs, but this is a complicated option best left for 'mark 3 or 4'.

Wheels are the easiest option, and the best permutation is three. Two wheels, and the robot falls over, four, and manoeuvring requires three-point turns. Using three wheels means we can have a motor attached to two of the wheels, and

ADI the alien

ADI is an alien whose mission in life is to bring the joys of learning to everyone willing to follow his happy-go-lucky way of addressing the subjects contained in this integrated learning package. The range covers English, Maths and French for ages 11 to 15. The packages have been linked to the attainment targets in the National Curriculum.



Get to grips with geometry with help from ADI and his maths package

The packages include a clock, a personal diary, a notebook, and a high score table. Icons along the bottom of the screen provide options for Help, Back One, Game, Forward One, Tools, and Start Application.

ADI introduces himself, and goes through the usual routine of asking your name and age to ensure politeness of address on subsequent encounters, and to record your performance against accepted attainment levels. His somewhat whimsical face changes expression as he reacts to your input, and continually supports the passage through the programs with advice and support.

Work, Chat or Play are offered as possibilities. Work begins the actual

! WARNING

Danger electricity kills! Unless you are absolutely sure about what you are doing, seek advice from an expert electrician before attempting any experiments in either of the two articles on robotics.

have one wheel as a jockey wheel. Turning simply requires reversed power on two of the wheels providing minimum turning circle – the software instructions are easy.

The two motors will need to operate off 12 volts (car battery) and be connected to a reduction gearbox. Without the gearbox, the speed of the axle would be too fast. The gearbox reduces the axle speed and increases the torque giving greater power. Suitable wheels, with rubber treads, are connected to the output shaft to produce drive.

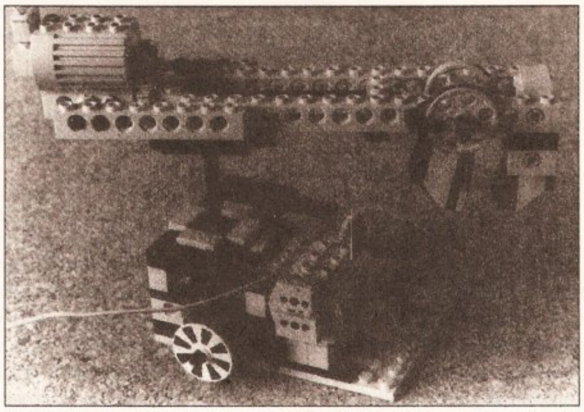
It it advisable to contact Switchsoft which will advise on suitable components for the construction, or you can go along to a scrapyard, buy a couple of windscreen wiper motors. These work off 12 volts, and have a gearbox incorporated in them. Check they have plenty of torque, and can be reversed by switching the polarity. Supermarket trolleys are a brilliant source of wheels for the jockey wheel, but go and ask for a damaged one, don't inadvertently push it all the way home!

NEXT STOP MARVIN

The Switchsoft motor controller module is ideal for smaller buggies, but would probably not cope with the high power switching necessary for a larger robot. The Relay module is capable of this degree of power. There are options for employing relays. A suitable combination is 2 double pole relays and one single pole relay. The single pole relay (as supplied in the Sensor and Control Experiment Kit) is used to switch on both motors. The two double pole relays are used to select forward and reverse for each motor. Alternatively you could use 5 single pole relay modules. Either of these options would use only 3 channels on the Switchsoft I/O port. You could use an additional relay for 'breaking'.

If the two wires on the motor are shorted together, the motor is made to stop suddenly.

Initially we are looking at driving the robot from an umbilical cable, but it is possible to include the Amiga inside the robot, and provide power to the Amiga from a battery source. The Amiga needs 5, and +12volts and -12 volts. This can be done by using the same battery as supplies the power to the wheels or by having a separate battery. It is safer to use a separate battery because the motors driving the wheels produce power 'spikes', and these could interfere with the power to the Amiga. A circuit will need to be built to provide the power for the Amiga, or, a device to change 12volts DC into 240volts AC can be used.



Good old Lego gets things under control. This is a robot arm which can pick up and swivel on one axis, an excellent building medium to develop ideas for bigger projects

TALKING TO YOUR ROBOT

Assuming you have your robot connected to a Switchsoft I/O port and are using AMOS, a few tips on programming your robot to behave. The commands are almost the same for other versions of BASIC, such as Hisoft, GFA or Amiga BASIC. Let's assume you have a single pole relay module connected to channel 1 on the port and a double pole (or 2 single pole relays) connected to channels 2 and 3. You'll need the I/O port disk supplied with the Sensor and Control Kit (or available separately for £4). This disk has subroutines supplied with it which are required by the following lines...

To go forward:

```
TURNON[1]
WAIT 150
TURNOFF[1]
```

This will make the robot move forward for 3 seconds then stop. If you change the second line to WAIT[50] it will be switched on for only 1 second. To go backwards:

```
TURNON[2]
TURNON[3]
TURNON[1]
WAIT 100
ALLOFF
```

To turn to the right:

```
TURNON[2]
TURNON[1]
WAIT 50
ALLOFF
```

To turn to the left, change line 1 above to TURNON[3]. To rotate round and round on the spot, change line 3 above to WAIT 1000 (20 seconds).

If you are using a Basic other than AMOS, you do not have a wait command. But there might be PAUSE, so use:

```
FOR d=1 to 2000
NEXT d
```

Building upon these subroutines, you can create a program enabling your robot to follow a sequence of patterns. Try, for example, to place your robot in a corner, and write a program which instructs it to follow a path across the room, around a chair, then out of a door. If you can manage to make it go to the kitchen and make coffee and bring it to you, send me the program!

MAKING SENSE OF IT ALL

Things get really exciting with the addition of sensors. There are all kinds of sensors which can be plugged into the Switchsoft I/O Port. In the Temperature and Light Kit there is a photo sensor. Two of these attached to the front of the robot can make it follow a black line on a white floor. The photo sensors should be connected to the analogue inputs. The program for this follows:

```
LINE FOLLOWER.....
FOR X=1 TO 1000
TURNON[1]
ANALOG1
IF PARAM>0 THEN TURNON[2]: ↵
WAIT 30 TURNOFF[2]
ANALOG2
IF PARAM>0 THEN TURNON[3]: ↵
WAIT 30: TURNOFF[3]
NEXT X
ALLOFF
```

Other types of sensors can be used. A microswitch connected to the I/O port can be used as an impact sensor which would register if the robot bumped into something. Or, there are infra-red "proximity" detectors which would stop the robot approximately 10cm before impact.

Using a light sensor to detect the arrival of evening can tell the robot to close curtains, turn on the lights and switch on the hi-fi with sampled dog barking and provide an effective burglar deterrent.

Andrew Mcowan of Switchsoft is obviously an enthusiast and will offer all kinds of brilliant advice. Any of the equipment detailed below would make the ideal gift for anyone who wants to use an Amiga seriously. AS

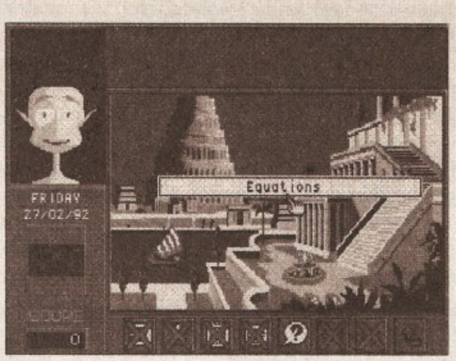
SHOPPING LIST

Input/Output Port	£27.95
Sensor & Control Experiment Kit	£27.95
Temperature & Light Exp Kit	£11.95
Motor with Gearbox	£11.90
Buggy Kit	£39.95
Single Pole Relay	£9.95
Double Pole Relay	£14.70
Gears & Pulleys pack	£14.50
Wheels & Axles pack	£5.95
Ramrod electric RAM	£25.40
Economy Motorised gearbox	£5.95
Mains Controller	£24.95
Dual Motor control module	£17.95

Available from: Switchsoft Dept. AS1092 26, Ridgeway, Darlington DL3 OSF
☎ 0325 464423

educational application, and this demands a security input from a large coloured grid, supplied with the package. I spent quite a long time with the 11 to 12 Maths and the 12 to 13 English.

I was fascinated by the way in which Europress has cleverly used the little alien, and made the process of error correction necessary, but still fun. Correct answers cause a character to tear across the screen and jump a hurdle. Incorrect replies and he goes head over heels.



The friendly face of ADI guides you through the maze of mathematics

CONCLUSION

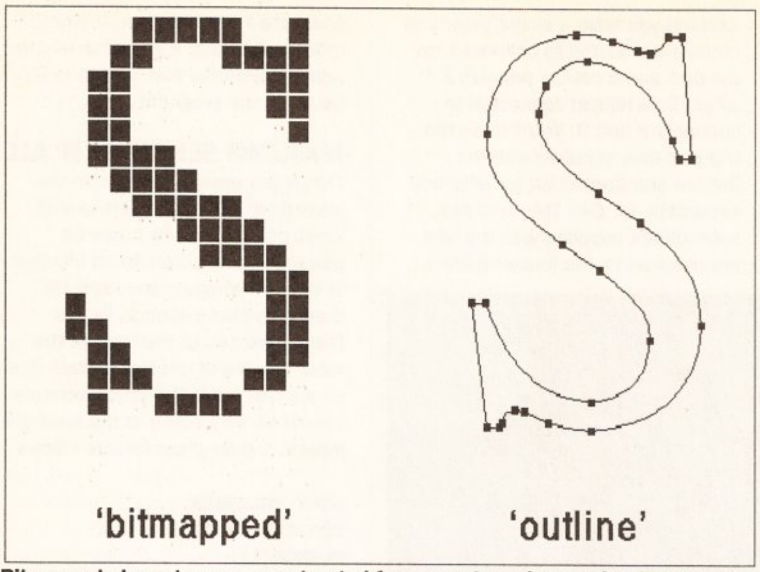
This is innovative software which breaks new ground in integrating the learning process. It has a huge database of questions, all very relevant to the age group concerned.

Definitely 5 star. One word of caution, I did experience difficulty initially as *ADI* refused to load until I switched off my GVP 68030 accelerator card.

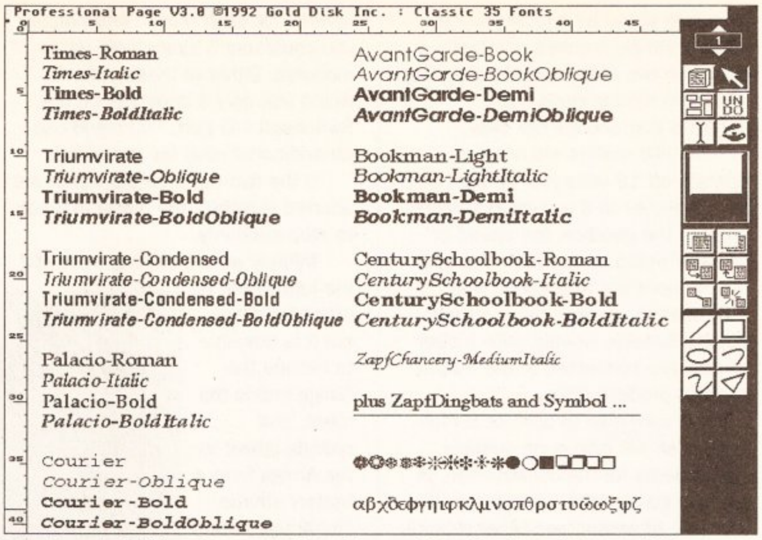
SHOPPING LIST

ADI Maths	11/12,12/13,13/14,14/15
ADI English	11/12,12/13,13/14,14/15
ADI French	11/12,12/13,13/14,14/15
All priced at	£25.99

Available from:
Europress Software
☎ 0625 859333



Bitmapped characters are constructed from a rectangular matrix of black and not-black dots; enlarging them introduces the 'jaggies', shrinking them results in the loss of some of the data. Outline characters are defined by control points and mathematical equations that describe the curves; no matter how much you shrink or enlarge them, they always keep their shape



The 'classic 35' typefaces, as found in most PostScript printers and the Compugraphic Outline Fonts pack, are composed of different styles of nine type families, plus dingbats and symbols type-faces. Triumvirate is the same as Helvetica, Palacio is the same as Palatino, CenturySchoolbook is the same as NewCentury Schoolbook. The Outline Fonts names are changed because the names of some typefaces are registered trade marks

In the final part of his tutorial on typography, Jeff Walker tells you all you'll probably ever need to know about fonts

Reverting to *type*

As desktop publishing has become cheaper and more accessible to the home user and the semi-professional, the mystique and terminology surrounding the subject of computerised typefaces has grown into a dark tower of confusion and misconceptions.

Even some so-called experts will go "Um..." when asked certain questions.

The purpose of this article is to knock some bricks out of that dark tower and bring it tumbling down, to explain the terminology and the way different computerised typefaces work. Armed with this new understanding, you will be able to talk confidently on the subject to the person sitting next to you on the bus, you'll be able to read advanced books and articles on DTP without getting headaches, and you'll not feel like a complete prat when the person behind the counter down the output bureau throws a mouthful of jargon at you. In fact you'll be able to smile and throw some jargon back, resplendent in the knowledge that you probably understood what they said better than they themselves did.

The first thing we must clear up is that when desktop publishing people say "fonts", they usually mean "typefaces". Remember from last month? A font is a particular typeface printed in a particular size and style – eg Times-Italic 24pt. Times is not a font, it's a type family. Times-Italic is not a font, it is a typeface. Times-Italic 24pt is a font.

Never mind what the advert says or what the package is called, when you buy a disk of 'fonts' you are actually buying a disk of typefaces. Unless they are "bitmapped fonts", which is where the story begins...

NOT FLEXIBLE

Bitmapped fonts are the simplest and least flexible variety of computer typefaces. The word "bitmapped" is an awful piece of jargon borrowed from the programming world; as far as bitmapped fonts are concerned, it means that individual characters are formed by arranging a series of dots inside a rectangular matrix to form a "map" of black and not-black dots. It's called a bitmap because each dot in the matrix requires one "bit" of computer memory.

You've probably got a dot-matrix printer. It's called dot-matrix because the characters it prints are formed in the way described above. If it helps, think of "bitmapped" as meaning dot-matrix.

The dot-matrix or "bitmap" for the computer generated characters can be as big as is required, but the larger the bitmap, the more memory each character takes up.

The advantage of bitmapped fonts is that they can be rendered quickly on-screen using the simple method of "one dot in the matrix equals one pixel on the screen". There's no calculating involved, all the computer needs to do is copy the data for the character from storage memory to screen memory – read-write-splat, a character on the screen in the tiniest fraction of a second. For this reason bitmapped fonts are often referred to as "screen" fonts.

But there's a snag. (Isn't there always?) Bitmapped fonts can be enlarged only by a method called "pixel replication". All this term means is that every pixel is multiplied by the same number to produce a larger font. To give a simple example: say we wanted a character to be twice as wide and twice as high – every pixel in the matrix would have to be multiplied into a group of pixels two pixels wide by two pixels high. And what have we got? Yup, we've got the jaggies!

You can see pixel replication for yourself by using *Deluxe Paint* to type a letter on to the screen, cutting it out as a brush and then pressing Shift-H to keep doubling the brush's size. After just a few doublings the character becomes incredibly ugly.

JARGON BUSTING • JARGON BUST

Ascender – The vertical stroke above the x-height in letters like b h k.

Baseline – The (imaginary) line on which all upper case and lower case letters stand.

Black Letter – Type in the Germanic style, often mistakenly referred to as Olde Englishe. (Often improperly called Gothic by people who don't like it.)

Body (type) – The space, measured from top to bottom, on which a letter is printed.

Body type – The type used for the main text of a document or publication.

Body copy – The main text of a document or publication.

Bold (type) – The thicker version of a particular typeface.

Because bitmapped fonts cannot be enlarged or reduced properly, a separate set of characters must be created and stored for every size you want to use. This takes up a lot of disk space – a four-size collection of 12pt, 24pt, 48pt and 96pt for example would typically require about 150,000 bytes – and lots of memory. And precious *Chip* memory at that.

So, as far as DTP is concerned, bitmapped fonts are only useful for on-screen work, no good for printed output. For that, we need a more sophisticated, structured system.

OUTLINES

Structured typefaces make use of 'outline' or 'vector' technology.

These typefaces are composed of mathematical equations (or 'vectors') which describe the shape (or 'outline') of each character. The outlines are defined by a number of control points. A straight line, for example, would typically be defined by two control points, one at the start and one at the end point.

Curved lines, or segments of curved lines, would be defined by a start and end control point, plus one or two 'attractors' which define the shape of the curve. These curves are known as 'bezier' curves, named after the person who invented them.

The most significant benefit of outline typefaces is that they can be easily manipulated by the computer. Because they are defined mathematically they can be scaled, skewed and rotated without loss of output quality. And no matter how much they are shrunk or enlarged, outline typefaces always retain their shape.

There are two types of outline typefaces whose names you will probably recognise, Compugraphic and PostScript.

Compugraphic typefaces are produced by AGFA Corporation, and these use 'second degree' bezier curves, which means nothing more complicated than the fact that curves are defined by a single control point between the start and end points. In plain English the mathematical equation that defined a curve in a Compugraphic character would read something like: "Go from this start point to that end point, travelling through this here inbetween point, using [some formula] to draw the curve".

There are two formats of Compugraphic typeface used on the Amiga. There's the kind that *Professional Page 3* uses, which comprises two files named 'fontname.lib', and 'fontname.metric'. The ".lib" file is the typeface outlines description, the '.metric' contains information concerning the character widths, and the different amounts of space that should be inserted between characters. (In typeface terminology the term 'metrics' means 'character width and spacing information').

The '.dat' files that *Professional Page* has for each typeface is unrelated to the actual Compugraphic format, but something *Professional Page* requires. *PageStream* also uses Compugraphic typefaces in this two-file format.

The other Compugraphic format is the kind adopted by Workbench 2 in which the outline data and the metrics are combined into a single file. Workbench 2 gives these files a '.type' extension and expects to find them in the 'FONTS:_Bullets_Outlines' directory. These files are the same format as the alternative 'CS' Compugraphic format that *PageStream* supports.

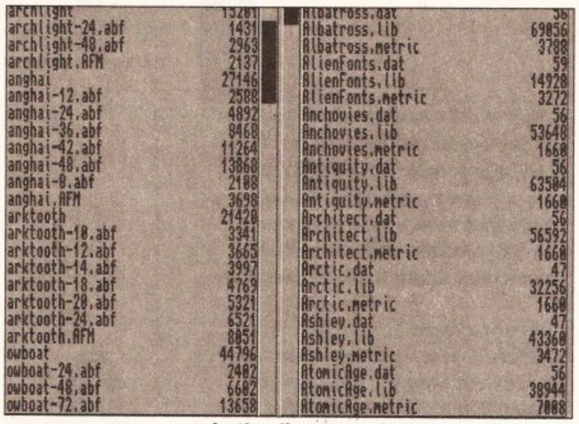
So, *PageStream* can use the Workbench Compugraphic fonts, but *Professional Page* currently cannot.

POSTSCRIPT TYPEFACES

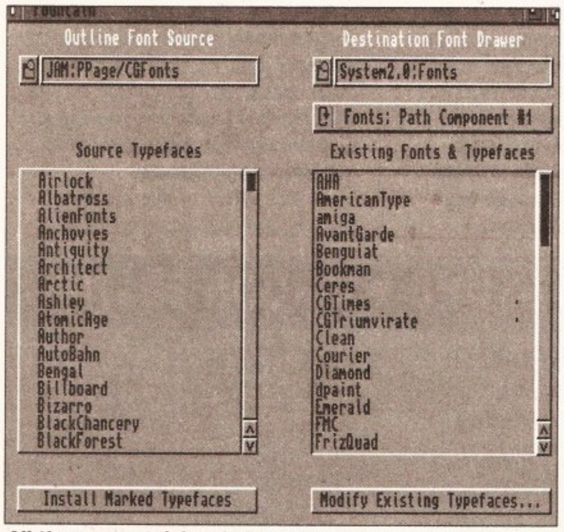
PostScript typefaces fall into two categories, Adobe Type 1 and Adobe Type 3 – Adobe Systems being the inventors of these standards, and also the inventors of PostScript.

The main difference between Type 1 and Type 3 typefaces is that Type 3 typefaces are written in standard PostScript while Type 1 typefaces employ a simpler version of the language which PostScript interpreters can render more quickly.

Another difference is that Type 1 typefaces are 'hinted' whereas Type



In the directory window on the left you can see the files that comprise some Adobe Type 1 typefaces. Note that in this case the Printer Font Binary files do not have the usual 'PFB' extensions, but they are still Printer Font Binary files. In the right-hand window are the groups of three files which are the Compugraphic typefaces *Professional Page* uses



All the commercial and shareware Compugraphic typefaces talked about in this article can be used by Workbench 2, although a few of the shareware ones may prove problematic. But at 20p to 30p each, who's complaining?

3 typefaces are not.

The term 'hinted' is a little tricky to explain. Some will tell you that it means that the curves are better defined – hinting has to do with the scaling and thicknesses of lines at small point sizes. If you can imagine a typeface that is constructed of very thin lines at something like 72pt, what happens to those lines if you scale the typeface down to be, say, a tenth of the size? If logic is applied and the lines become 10 times thinner, it's possible that when they are printed they'll be so thin that you can't see them. Hints tell the output device that 'the line that forms this part of *this* character of *this* typeface in *this* size should be *this* thick'.

Type 3 typefaces comprise a single file, normally given the extension '.psfont'. The main use of Type 3 typefaces is for when you want the font description to be part of the PostScript file, which means there will never be any danger of a remote PostScript output device not being able to print it because it doesn't have that particular typeface built into it or available on disk. Type 3 typefaces are sometimes called Pure PostScript, and even sometimes Pure Type 1, which can be be confusing.

Type 1 typefaces – usually called PC Type 1 to distinguish them from Pure Type 1 and Adobe's Macintosh format Type 1 typefaces – comprise two files, plus an optional third file which is a low resolution screen font that can be used for speeding the display. The description of the outline of all the characters in the typeface is contained within the larger of the two main files, normally given the extension '.PFB', which stands for Printer Font Binary. Information concerning the metrics – the character widths, and the amounts of space to be inserted between different characters – is held in the smaller 'AFM' file, for Adobe Font Metric.

If there is a screen font for the typeface, it will have a filename of something like 'Fontname-24.ABF' – 24 being the point size and ABF standing for Adobe Binary Font (not to be confused with Printer Font Binary).

The curves in Type 1 typefaces are defined by 'third degree' bezier curves. Remember we learnt earlier how Compugraphic typefaces have one control point or 'attractor' to describe a second degree bezier curve? Well Type 1 typefaces use two attractors. This makes them more flexible than Compugraphic typefaces because fewer segments are required to describe each curve. It also makes Type 1 typefaces more difficult for the software to work with.

Professionally speaking, because of the hints and the two attractors, Type 1 output is of a higher quality than the un-hinted Type 3 or one-attractor Compugraphic typefaces,

RGON BUSTING • JARGON BUSTING

Book (type) – The medium version of a typeface, normally intended for continuous use (as opposed to headings and the like).

Cap height – The height of capital letters in a particular font, measured from the baseline.

Character – An individual letter, number, punctuation mark.

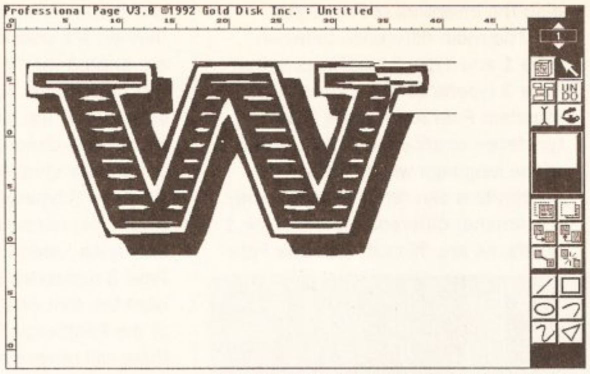
Condensed – Type that is narrower than the standard face.

Copy – Text, in manuscript or on disk, that is ready for setting.

Cursive – Type that imitates a formal or informal handwritten style.

Decorative (type) – Ornate typefaces not usually used for continuous text (Also called Display)

but only so far as high resolution PostScript output devices are concerned. It is the PostScript device that does the hinting, it's not actually part of the typeface description, so Type 1 characters that are printed on dot-matrix printers without going through a proper PostScript interpreter (as per *PageStream*) are printed without the hints.



A shareware Compugraphic typeface can produce rogue characters. The W has gone weird at top-right, which means I can't use this typeface for words that have a W in. I've never had this problem with converted commercial Adobe Type 1 typefaces

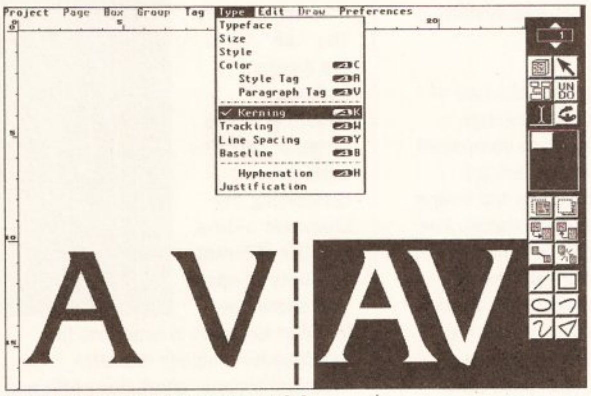
The same is not true of Compugraphic typefaces, which were designed specifically for printing on non-PostScript printers. Although the hinting isn't as sophisticated as PostScript hinting, the Compugraphic hints *are* applied. The upshot of this is that small point size Compugraphic typeface output to non-PostScript printers is usually of a higher quality than small point size Type 1 output to non-PostScript printers. Once you get above about 12pt, though, Type 1 typefaces have the edge, although a lot depends on how much care and attention the designer lavished on the typeface.

All structured typefaces have one serious limitation, the fact that they cannot be splatted directly on to the screen in the way bitmapped fonts can. The outlines of structured typefaces must first be converted into bitmaps before they can be displayed. This takes time. Compugraphic typefaces, which use the simpler one-attractor outlines, convert far more quickly than Type 1 typefaces, which use two attractors.

The software will normally get around this problem by 'caching' the bitmapped characters as it goes, storing them in memory in case it needs to use them again. This is why the first time you use a Compugraphic or Type 1 character in a particular font it will take a little while to display on-screen, whereas when you use the same character in that font again it appears more quickly.

How many characters the software can cache depends on how much memory you have available; if you have little memory then almost every character you use will have to be converted every time you use it. So more memory really can speed up your desktop publishing.

A side effect of this memory caching technique on the Amiga is that as more characters get cached, memory becomes more fragmented. When you come to print your document the software will throw the caches away to free up memory for printing, but the memory that gets released will sometimes be all over the place, not in one contiguous chunk, especially after a long DTP session or if you have been in and out of different magnification levels. The software will need a fairly large chunk of contiguous memory to print the document, and if it can't find a big enough chunk you'll notice that bits of your document don't get printed. In this situation you have to save your document, re-boot your Amiga to de-fragment memory, load the software and the document again, and try another print. It's not enough to quit the DTP program and run it again, to defragment memory you have to re-boot, there is no other way. The more memory you have, the less frequent this problem will be.



Where relevant, the commercial *Computer Safari* fonts contain kerning information so that certain character pairs fit together better. Above, unkerned on the left, kerned (and highlighted) on the right

TYPEFACE SOURCES

Various Compugraphic and Adobe typeface packages are available, and you needn't have to buy them on Amiga formatted disks. Using a program like *CrossDOS* or the shareware *MultiDOS* you can buy Adobe Type 1 typefaces on PC formatted disks and transfer them on to Amiga formatted disks or your hard drive, after which *PageStream* will be able to use them directly and *Professional Page*'s *FontManager* program will be able to convert them to Compugraphic format.

There are at least three Adobe typeface packages available on PC format disks, the Adobe Typesets 1, 2 and 3. The best thing to do here is to flick through the adverts in a PC magazine, find someone who sells them, phone and ask for details. Be prepared to spend between £50 and £120 for each package.

The 'Classic 35' typefaces that are built into most PostScript printers come in two PC packages, Adobe Type Manager (13 typefaces) and Adobe Plus Pack (the other 22). Typically this combination will cost you about £200. I hope this puts the £80-ish price tag of the *Compugraphic Outline Fonts Pack* for the Amiga into some perspective, which contains the Compugraphic equivalent of the typefaces in those two Adobe packages.

You could also trawl the PC shareware libraries for Adobe Type 1 typefaces. There are thousands to choose from, but you must make sure that the typefaces you buy come with the '.PFB' and '.AFM' files. There will probably be other files as well, like the '.PFM' file that *Windows*™ uses, but as long as you've got the Printer Font Binary and the Adobe Font Metric files, you can use them with the current version of *PageStream* and *Professional Page*'s FontManager.

A British source to check out is Bitstream. At the time I am writing this article Bitstream's range of typefaces for the PC is still in its own proprietary format, but the company is smack in the process of converting them all to Adobe Type 1. By the time you read this they should be available. Can't tell you exactly what and how much because it hasn't happened yet; phone Bitstream (0242 227377) and ask for details.

Don't buy Adobe typefaces on Macintosh disks, not because you won't be able to use the typefaces, but because you won't be able to read the disks without extra hardware and software. Almost everything Adobe for the Mac is available for the PC as well, so get your safari suit on and hunt them down.

Talking of safari, Essex-based EM Computergraphic (0255 431389) has recently imported Computer Safari's range of Adobe Type 1 typefaces from the States and is selling them at extremely reasonable prices on Amiga formatted disks.

There are 24 disks available, most containing three typefaces, although a few disks contain four or five. The first 16 disks are £7.99 each, the remaining eight are £12.99. The difference in price is not because the last eight contain more, it's simply because these disks contain faces that Computer Safari considers to be of greater aesthetic value, and so charges more for those particular disks.

JARGON BUSTING • JARGON BUSTING

Display (type) – The larger sizes of type used in headings.

Descender – The part of a letter that comes below the baseline in lower case letters like g p q y.

Desktop publishing – A means of publishing in which all stages from writing to typesetting are done by means of a computer and software.

Font – A particular typeface printed in a particular size and style. (Note: a font is not the same thing as a typeface.)

Gothic – Properly used to describe Sans-serif typefaces, but also commonly applied to the Germanic or Olde Englishe style which is more properly called Black Letter.

Indent – Setting that is less than the full column width; not just the space inserted at the beginning of a line, but also any space inserted at the end of the line (eg left and right margins for text in panels).

Italic (type) – The sloping-to-the-right version of a particular typeface. (Also called Kursiv or Oblique.)

Measure – The width of a column of text, normally specified in picas.

Page depth – Length of the text area on the page (ie from top to bottom).

Pica – A unit of typographical measurement, 12 points = 1 pica.

Point – The basic unit of typographical measurement. In desktop publishing, 72 points equals exactly one inch.

All the Computer Safari typefaces work fine with all versions of *PageStream*, although version 2.1 or above will be needed to use the Adobe Type 1 versions of the typefaces. I tested them with *Professional Page*'s *FontManager*, and it converted them all except one called Celeste (on Disk 14) which gets three-quarters of the way through and then gives up the ghost. EMC knows about this problem and is trying hard to correct it. To date Celeste still won't convert, so it might be best to phone and check before buying this one.

Something else that is happening as I write is the conversion of the Computer Safari Type 1 typefaces disks into disks of Compugraphic equivalents, so by the time you read this *Professional Page* users will be able to buy the collection pre-converted if you don't want the bother of doing it yourself.

PageSetter II users can also get in on the act because EMC provides the additional '.atc' files that this program requires in order to use Compugraphic typefaces.

ON SAFARI

The Computer Safari typefaces are mainly Decorative and Cursive, although there are versions of classic Serif faces like Bodoni, Quadrant, Gourda and Bookman Demi scattered about the first 16 disks. Some of the typefaces in the £12.99 collections are very nice, including an excellent Black Letter typeface called Wedding Text, which is that Olde Englishe design that so many people like to use in letterheads.

There are about 80 typefaces currently available, and a quick call to EMC will no doubt result in the acquisition of an example sheet of what they all look like.

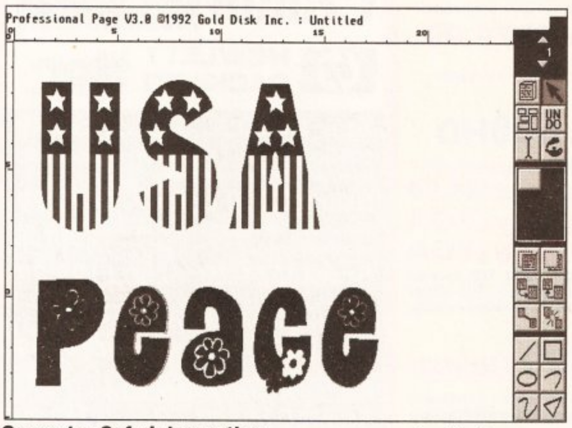
EMC also stocks a large range of public domain and shareware Adobe Type 1 and Compugraphic typefaces, sold in five-disk volumes for £12.50.

Each of the Adobe Type 1 volumes, which can be used by *PageStream 2.1* (and above) and *Professional Page 3*, comprises between 60 and 90 typefaces, and there are all sorts of goodies to be found. Crillee and Ultra Black in Volume 4 are two of my favourites, along with Black Chancery and Lefty Casual.

There's a smashing little Lucida type family in Volume 6, along with the truly desirable MBembo (Serif), MGillSans (Sans-serif) and MRockwell (Slab-serif) families and the infinitely discreet and delicate Muriel Cursive typeface.

DavysRibbons in Volume 7 will knock your socks off, as might HeadHunter which is a ghoulish typeface constructed from bones.

At an average of about 18p per typeface it's impossible to criticise, although a lot of these typefaces are shareware and strictly speaking you should send a contribution to the designer of the typeface if you find it useful and intend to keep it. The shareware typefaces will have documentation which tells you how much to send and where to send it; your conscience will do the rest.



Computer Safari decorative typefaces: using two overlaid copies of the same word, one with the baseline shifted, the stars part of 'USA' is in blue, the strips bit in red. In the word 'Peace', each has a differently coloured outline and the flowers are also coloured

The biggest problem with these shareware Adobe Type 1 collections is that many will not convert through *Professional Page*'s *FontManager* into Compugraphic format. There's no way to tell which will and which won't, except by trying it out. Which is why EMC is currently sweating over a hot computer doing the conversions for you. Two five-disk volumes of shareware Compugraphic typefaces are already available, with more planned. The typefaces on these disks will work with all versions of *Professional Page* from version 1.3 onwards, *PageSetter II*, and Workbench 2 as well of course. Again, they cost £12.50 and average about 60 typefaces per volume, about 20p per typeface.

Another company which stocks shareware Adobe Type 1 and Compugraphic typefaces is George Thompson Services (0707 664654). This company has two volumes of shareware Adobe Type 1 typefaces and two volumes of shareware Compugraphic typefaces.

GTS's Adobe Type 1 volumes are five disks big and each costs £10.99. Although these are cheaper than EMC's volumes, GTS hasn't managed to pack quite as many typefaces on to each disk, and if you sit down and work out the cost per typeface it works out almost exactly the same. The GTS Compugraphic volumes each comprise three disks of approximately 30 typefaces and cost £9.99; about 33p per typeface. Again they will work with all versions of *Professional Page* from 1.3 onwards, *PageSetter II*, and Workbench 2.

There are a couple of caveats you should keep in mind when buying shareware typefaces. Firstly, the odds are that the typeface will not contain a complete character set. All the letters and numbers will probably be there, plus the basic punctuation marks, which is the main thing I suppose, but you shouldn't expect extras like foreign characters and the other special characters that professional typefaces include. As they originate mainly from North America, some shareware typefaces may not even include a pound symbol.

The second caveat is that the shareware Compugraphic typefaces that have been converted from Adobe Type 1 with *Professional Page*'s *FontManager* are not always correct. In a few typefaces there may be one particular character that renders badly, or a few alphanumeric characters that won't render at all.

Whether this is *FontManager*'s fault or a bug in the Adobe Type 1 data is open to argument. Problems very rarely happen with *FontManager* when converting professional, commercial Adobe Type 1 typefaces, which leads me to believe that the main fault lies within the Type 1 data of the shareware typeface.

There are literally thousands upon thousands of commercial and shareware Adobe Type 1 typefaces available; mainly over the other side of the Atlantic, but for a start you can phone MicroPace (0753 551888) and ask about Soft-Logik's Type 1 collection, which is enormous and contains versions of all the classic, time-honoured type families.

If you've got a modem and comms software there are companies which will sell them to you on-line and transmit them down the phone to you. Try GraphiService London Ltd on 071 724 8834 (voice), 071 724 4689 (modem).

As for designing your own Adobe Type 1 and Compugraphic typefaces, at the moment the only Amiga utility which will enable you to do this is a German program called *Font Designer*. HB Marketing (0753 686000) is negociating with the manufacturers to bring an English version to the UK, so if you want it too, phone HBM and say so, as the man making the deal is unsure whether it'll sell here or not. It won't be expensive – I told him you'd kill for it, so don't let me down.

Thanks to Stuart "I've got a lot of fonts" Anderton, Don "Who?" Cox, Seppi "What a silly first name" Evans, Errol "What a silly last name" Madoo, and Paul "Wanna buy a copy of AmigaTeX?" Ockenden for their help and advice during the preparation of this article.

JARGON BUSTING • JARGON BUSTING

Roman (type) – The upright version of a particular typeface. (Also called Regular, Book or Medium, and sometimes Antique or Gothic.)

Sans-serif – A typeface without serifs. (Also called Grotesque.)

Semi-bold – A weight of typeface that is heavier than Medium but not as heavy as Bold. (Also called Demi.)

Serif – The small stroke at the end of the main stroke of a letter.

Set – To assemble letters into words and lines.

Slab serif – A typeface with bold strokes and thick, square serifs. (Also called Egyptian.)

Swash – Characters with additional flourishes.

Type – Letters, numbers, punctuation and other non-alphabetic characters.

Typeface – A particular style of type.

Type family – A series of typefaces in different weights and widths, but with the same design characteristics.

Typeset – Text printed in a recognisable typeface.

Ultra – An exaggerated heavy version of a particular typeface.

Wide (type) – The wide version of a particular typeface.

x-height – The height of lower case letters in a particular font, measured from the baseline.

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Master of ART

Gary Whiteley enthuses over Imagemaster and shows you how to use lighting to effect...

I spent quite a while pondering how to approach this appraisal of Black Belt's *Imagemaster* software because it's hard to know where to begin. What we have here is a hybrid picture compositor, animation tool, image processor, format convertor, paint program and more. I've spent the best part of a week just trying out features, checking the results of ARexx operations, compositing images and constructing animations and I've realised there's a lot of power in *Imagemaster*. At times the problem has been harnessing this power creatively and using it sensibly, as it's too easy just to go wild with all the new gizmos available.

Imagemaster is a descendant of the *Image Professional* software which was provided with the HAM-E display device, though it has been upgraded immensely and freed from the shackles of the HAM-E, in terms of output display and features. Where *Image Professional* was limited to working with the HAM-E, *Imagemaster* works with various 24-bit devices, DCTV and can display directly to the Amiga's RGB monitor.

Not only has the software been improved but there is now a real manual for it, though because of the constant upgrading and improvement policy which Black Belt operates there is also a substantial (50 sides of A4!) manual update supplied on disk to keep you up-to-date. The version of *Imagemaster* under scrutiny here is 9.11, though by the time you read this there is likely to be at least another upgrade!

But that's enough beating around the bush. Let's get down to business and get inside *Imagemaster*...

BUTTON CRAZY

The first thing to attract attention is the user interface, which has none of the familiar pull-down menus and is unique among Amiga user interfaces. *Imagemaster* is extensively button-based, and more banks of point-and-click gadgets appear in response to your actions. This *modus operandi* appears to be a necessary evil, as *Imagemaster* gains a lot of flexibility through this approach, even if it can be cumbersome, confusing and frustrating.

I well remember the early problems I had using HAM-E's *Image Professional* and for the first-time user *Imagemaster* is likely to be an equally daunting prospect, as navigation around the buttons can take some serious wetware training, though familiarity *will* come in the end. Otherwise the rest of *Imagemaster*'s user interface is reasonably straightforward and the file requesters should present few problems.

START SIMPLE

At its simplest, *Imagemaster* is an image processor, capable of applying hundreds of processing methods to a loaded image, from the mundane to the incredible. Simple actions such as brightness and contrast tweaking, colour correction, colourisation and gamma operations lead to more sophisticated concepts such as picture sharpening, blurring, anti-aliasing and clean-up operations. Further advanced are the special effects which include colour tricks like false colouring, contouring, solarising, posterising and line art, oil-paint and watercolour effects, relief mapping and palette shifting.

Finally there are the complex geometric transformations such as waves, explode/implode, perspective scaling, flipping, drooping and caricaturing, not to mention spiral blurs, zig zag, mirror and motion blur. Add resizing, zooming and shrinking factors, gradient fills, rotations, X-Specs support and you'll get some idea of *Imagemaster*'s capabilities and, while this might already sound comprehensive, I've probably only mentioned about half of the range of processing operators available.

GET COMPLICATED

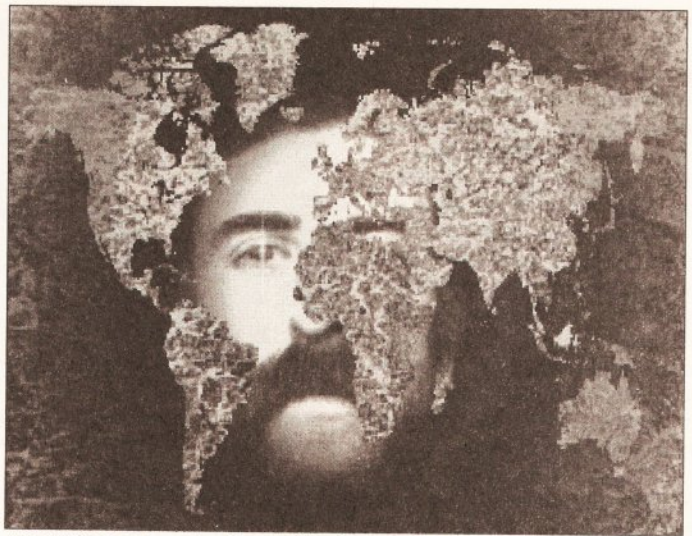
A great deal of *Imagemaster*'s power comes from its ability to operate on a selected region of an image, and once again the methods of defining an area are wide. Simple selections such as dragging out a rectangle or an ellipse are quickly achieved. Freehand or polygonal areas can be similarly defined, or operations can be carried out only in areas of selected colours and shades – which can give effects similar to luma and chroma-keying in TV. Areas can be excluded from operations too, or the entire image can be selected. Multiple operations can be carried out on just one area by using the Previous Region button to add a new effect in the last area selected – and if something goes wrong there's always the UNDO button.

As you'll gather, there are many possible operators which can be running simultaneously, and sometimes it's easy to forget just what is going on at any one time.

INPUT AND OUTPUT

Imagemaster supports a variety of image formats, with more being added at every upgrade. All standard IFF formats can be loaded, plus JPEG/JFIF, HAM-E, DCTV, TARGA, NASA JPL, SHAM, ARZ, Black Belt's own PMBC exact image format, Impulse RGBN/RGB8, RAW and others. *Imagemaster* can even extract and load single frames from IFF animation files!

With *Imagemaster* what you see



No cutting and pasting here. Blending, colour masking and merging were some of the techniques used to composite together three different images with *Imagemaster*

ANIMATION BUILDING

If you are stuck trying to turn a Multi-Frame Sequence into an animation here's the way to do it.

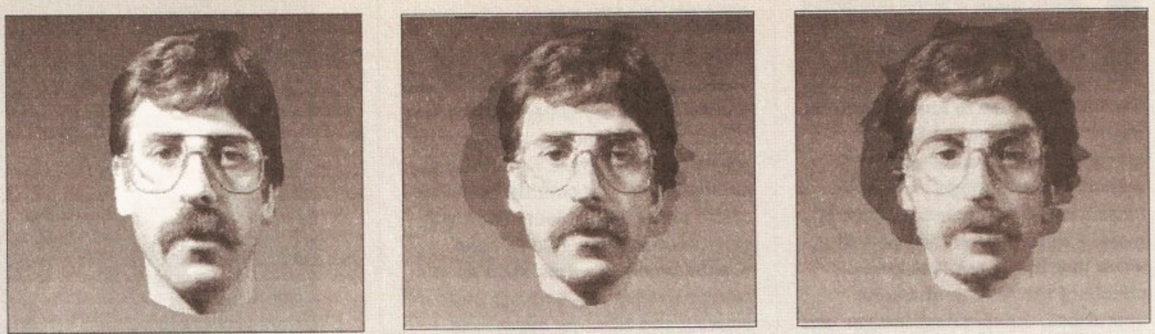
Make sure ARexx is running on your Amiga, then select your frames from the Multi-Frame Sequence requester. Next click on the "Set Scripts" button and type RXPI:ANIMWR1.REXX into the Opening Script box. This will call an ARexx script from the rxpi: directory which should be in your REXX drawer and start executing the animation process. Unless you wish to process each image before compositing into the animation you can leave the Pre-Render box empty. Next type 'RXPI:ANIMWR3.REXX' in the Post-Render box and finally 'RXPI:ANIMWR4.REXX' in the closing script box. Return to the Multi-Frame menu and select Run List, choosing Test Run and Execute to see that all is well. If everything looks OK, run the list again, but this time select Save as 24-bit or Render Results (to save the images in the current output format) and take a break. Finally, use a program like View, ShowAnim or RTAP to see the resulting ANIM OP-5 animation, unless you saved only in 24-bit frames, in which case you'll need to put them together onto videotape.

By the way, in case you hadn't realised it, Multi-Frame could also be used to batch process pictures and convert them all to the same format – a very useful feature for animators wishing to convert different resolution images for use in their animation.

on the Amiga screen isn't really what you get. The simple explanation for this is that all *Imagemaster*'s operations are carried out in 24-bit, even though the Amiga itself cannot display 24-bit graphics, so the computer display screen is only a good compromise. Within the limits of the Amiga's own output the screen mode can be selected by the user, but the resolution is always derived from the loaded image. So while an overscan 24-bit image can be loaded, it cannot be displayed in all its glory on-screen – rather a shrunken version will be produced to fit the Amiga screen mode chosen.

Dithering can be used to approximate the original image and a good-looking picture can be seen by using an interlaced HAM display. But behind the scenes the data in the memory buffers remains in 24-bit. If you have a 24-bit display card such as Harlequin or Impact-Vision 24 you can use it to display the image in full, smooth, 24-bit colour. Several display devices are supported, and no doubt Black Belt will be adding more as soon as it possibly can.

Lastly, *Imagemaster* is as flexible on output as input. Data can be saved in a variety of formats. All the standard IFF modes are possible, plus 24-bit, HAM-E, DCTV, JPEG/JFIF, RGB8, TARGA, RAW, GIF, PMBC and ANIM OP-5 formats.



This is how Gary Whiteley turned himself into the renowned composer Ludwig van Beethoven. As you can see from

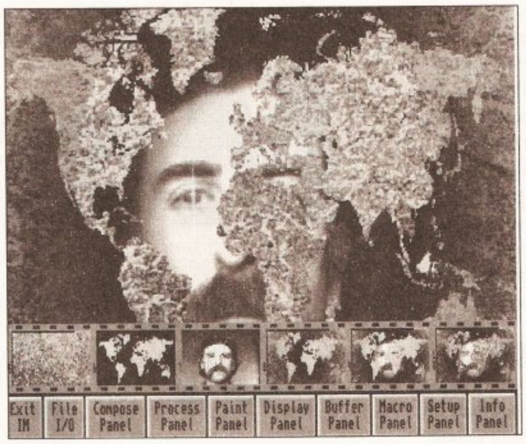
IMAGE BANKS

Let me explain how *Imagemaster* uses memory buffering in a little more detail. By storing pictures in available memory, a bank of images is ready for use in an instant. The visible image always consists of the contents of the Primary buffer, while the Secondary buffer is used as the second image in compositing operations. Other buffers may be held for use as memory allows and designated as primary or secondary as needed. Areas clipped from the primary buffer can also be held as Clip buffers.

The beauty of the buffering system is that a number of items can be held in the computer for fast access and operations, though again it can be confusing if you lose track of exactly what each buffer contains. To help the old grey matter sort this out the buffers can be named as you like, just as any other data file can, and old and expired buffers can be selected for deletion to free memory.

MORPH AND ANIMATE

An entire article was dedicated to



With the filmstrip you can see where you've been by keeping a pictorial record of previous operations

Imagemaster's morphing feature in *Amiga Shopper* 15, so I'll keep it brief. Morphing is a process which lets you transform one image into another through a series of intermediate stages.

You've seen it on the box in Michael Jackson's *Black and White* pop video, in *Terminator 2*, etc etc and now it's appearing on a computer near you. It's a great effect that requires work and memory to achieve good results. I grappled with morphing for a good while and whilst I was pleased with some results, others left me wondering what (if anything) I was doing wrong, but the docs were of little help when it came to troubleshooting. The problems I was getting seemed to be that the morph was either becoming more like a cross-fade between the two images, or strange blobs of image would appear where they wouldn't be expected to. So, all in all I found morphing to be a bit of a hit and miss affair really. There, I told you I'd keep it brief!

Incidentally, I've heard rumours that a coming version of ASDG's *Art Department Professional* will also have a morphing feature, looks like the war is far from over.

FRAME SPLICING

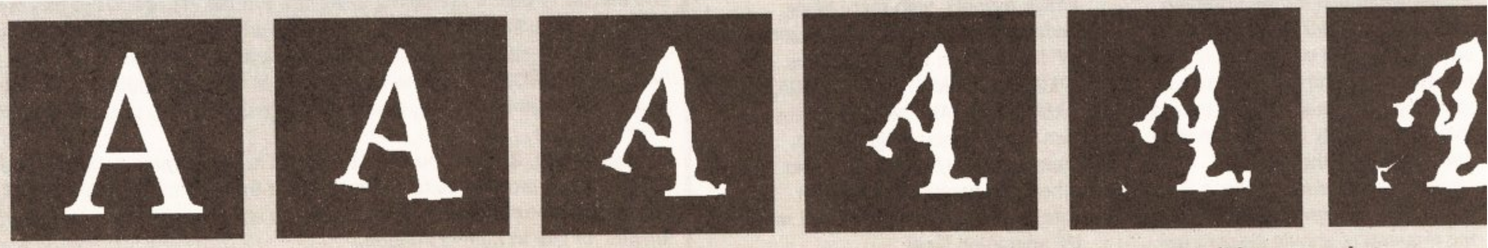
Animation construction is another of *Imagemaster*'s potential strengths. By using ARexx programs to control the loading and processing of a series of pre-made or *Imagemaster*-generated frames, *Imagemaster* can paste together a seamless ANIM OP-5 animation file. If pre-made images are used then this is a cinch – almost as simple as selecting the files to be animated, defining the rendering format and leaving the Amiga to get on with the sticky part. It's just tough figuring out how to get it going the first time round because the documentation seems to assume that the user has an innate knowledge of the innermost workings of *Imagemaster*. OK, it isn't hard to use the Multiple Frame Sequence animation builder – but a little clearer explanation wouldn't go amiss! For those of you who need more enlightenment there's a box-out on page 69.

The same three ARexx programs which do the animation building can be used in more creative ways by interposing a fourth ARexx routine to process some aspect of the image sequence. Again, I must criticise the lack of explicit information from Black Belt here, as I wasted too much time trying out routines which often never worked as I would have expected. More (complete) ARexx examples, with better annotation would help. I admit that while I am no big-time programmer I *do* have a brain and I *can* figure things out if the instructions are OK. Now if only I can work out how to batch convert those RGBN files I'll be laughing...

More frustration was to come. I read that a new Zoomclip function had been incorporated, making it possible to zoom into an image and animate the sequence, but the fragment of code provided just wasn't enough. Try as I might, I

DON'T GET CONFUSED

Imagemaster is a 24-bit image processing system which operates on IFF and other format images. It is *not* a real-time video processing system – I say this as I've had some inquiries about how *Imagemaster* compares to the Video Toaster! Along with ASDG's *Art Department Professional*, *Imagemaster* occupies the high ground of Amiga image processing, being touted as competition for software such as Adobe Photoshop on the Mac.



Morphing isn't all sweetness and light – inexplicable things sometimes happen. Morphing from A to Z with a rather bizarre meltdown occurring



the above sequence of pictures, the effects which can be achieved are pretty striking. Da da da dah!

couldn't automate this function, though I had no problems zooming in frame by frame under manual control and animating the results.

All was not lost though, because after a lot of headbashing I did manage to master the Roll function – which lets an image (or a portion of one) be scrolled around the screen – proving that I could work out some of the effects, if the information was more or less provided!

I'd love to see more support for the ARexx side of things coming from Black Belt – whether it is self-generated or simply the distribution of other people's public routines – because there is great potential here for doing fantastic batch operations and producing amazing results.

PAINT YOUR AMIGA

Did I mention that there's also 24-bit painting included in the software? And that it has font support, 2D and 3D rotation, clipping, lots of smooth range fills, and a variety of brush techniques to boot? I didn't? Well, now you know. Obviously, using the Amiga as a display device means that it isn't possible to paint in real-time 24-bit, as the display has to be converted to the current (non 24-bit) screen mode, but for many operations this isn't too much of a problem. Smoothly ranged backgrounds, for instance, can be easily produced in a variety of styles – radial, horizontal or vertical cylinders, dual ranged, warped or otherwise – ideal for backgrounds. Although *Imagemaster*'s paint features aren't friendly enough to replace those of dedicated software such as *TVPaint* they do provide a variety of tools for text compositing, colour fills, brush effects and so on, but on the whole the interface slows down creativity and my overall impression was one of frustration, rather than elation at Black Belt's thoughtfulness.

SEPARATE ISSUES

Yes, there's more to come. *Imagemaster* has colour separation facilities for turning full colour images into output-ready colour separations for inclusion in your favourite DTP program. Now, I don't pretend that I know a lot about this area of things, but with CYMK, CMK and RGB separations, plus ink mix correction, undercolour removal and output in 12 or 24-bit formats, plus CMAP (for colour previews) I should think that it would do the job, bearing in mind that the requisite dithering routines could already have been performed elsewhere in.



A quick composite of scaled 24-bit images and text to show the effect of *Imagemaster*'s Shadow function

THE FILM STRIP

Another great thing about *Imagemaster* is its Film feature, which lets you have a small strip of 'film' on your Amiga screen. Each frame of this film can be filled with an image, usually derived each time the Primary buffer is changed. The result is a roll of tiny black and white images which can be played back just like a mini animation, letting you get an idea of how the full-scale action is developing, or simply as a note-pad for what you've been doing. A further bonus is that the film can be saved for later viewing – maybe useful as a notebook or storyboard. A *colour* film strip would be nice though!

SHADOW BOXING

To conclude my spin through *Imagemaster*'s features I shouldn't forget a couple of other operations – Perspective and Shadow. Perspective operates on the entire primary image, giving rotation around all three axes and movement through the Z (front to rear) axis to produce an effect of depth. The result is a clip which can be used for compositing. Shadowing is just that – any clip which is composited will be shadowed according to the angle, offset and intensity of shadow setting previously determined.

Lastly, another gripe. There is a function called User Convolve, which appears to allow the user to define the matrix which operates on the selected area to make such changes as blurring, sharpening etc. This is a complicated matter, but to pass it off in the manual with the comment "Using this function really does require an understanding of what a convolution actually is" and give no more explanation is daft. Black Belt, get your printed matter together!

WEALTH WARNING

Imagemaster is *serious* software and as such requires serious commitment to Amiga hardware. Because it holds 24-bit images in buffers a *lot* of memory is needed, with a bare minimum of 3Mb, though more is required for compositing large resolution images or multiple buffers. *Imagemaster* can eat as much memory as you've got and can handle images up to 32767 x 32767 in 24-bit if there's room! It's possible that *Imagemaster* could be run from floppies, but by the time you've loaded software, images and all, you'll be wishing you were using a hard drive! An accelerator comes in handy for shifting the huge amounts of data needed when compositing or manipulating 24-bit images. I recommend you upgrade to WB2.04 if you haven't got it yet, as *Imagemaster* runs much better under this – and you'll also get ARexx, which is almost obligatory for getting the best out of the *Imagemaster* software.

SHOPPING LIST

Imagemaster........................ £175
by Black Belt Systems
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☎ 089 687 583

CHECKOUT IMAGEMASTER

Documentation ●●●○○
Overly keen 'Try it out' approach; often short on detail and worthwhile tutorials.

Features ●●●●●
Brilliant – packed to the gills and more being added!

Usability ●●●●○
Quirky interface but not hard to use after some concentrated learning.

Speed ●●●●○
Needs mucho RAM and an accelerator to really fly, but then so do many 24-bit programs!

Flexibility ●●●●○
Extremely versatile, very flexible, but needs more practical examples.

Overall rating ●●●●○

A power tool for power users – not as elegant as *Art Department Professional*, but certainly a heavyweight, if sometimes capricious, image processor.



round about half way through the process

This series of images illustrates the basic use of lighting and its effects







Left: Lighting with the Key Light in direct line with the camera produces flat, featureless modelling
Middle: Moving the Key Light upwards and to the left improves the modelling but produces quite hard shadows
Right: Adding a softer Fill Light to the right of the camera reduces the harsh shadowing and reveals detail



Finally, a Back Light is added directly behind the head. In this case the effect is slightly overpowering

MAKING LIGHT WORK OF 3D

While pumping out some Amiga graphics on a film set a few weeks ago I had a flash of inspiration. How about writing a piece on lighting for 3D? After all, real and virtual worlds have to be lit for the camera, and there's a lot of common ground in the techniques which are applied. Fortunately for the 3D modeller there are no generator trucks or huge coils of cable to clutter up the working environment, and no-one sweats in virtual reality, unless he's a Lawnmower Man. Bulbs don't blow and light can be cast for infinite distances – and the only electricity bill is the one you pay for your computer – a virtual 20000 Watt lamp costs no more to run than the image costs to render.

So, with the help of the disembodied head of Ludwig Van B and a chequered background, it's time for some light relief and a quick tour of some basic lighting techniques.

REAL WORLD LIGHTING

Whole books have been written about lighting theory, but space is tight, so I'll concentrate on some of the main elements.

Firstly, 3D objects in the real world need to be given a sense of shape, form and texture – this is often achieved through skilled lighting involving the correct placement of lights for the subject matter – producing shadows to accentuate the features of an actor, for instance, and imparting atmosphere and depth to a scene. Many of the same rules apply in the virtual 3D world – making shadows to add depth, filling out dark areas and adding interest with colour.

Secondly, most 3D software offers a choice of lighting types and the ability to place a number of lights in a scene. The main restriction is that the more lights that are placed, the longer the rendering time will be.

THE KEY

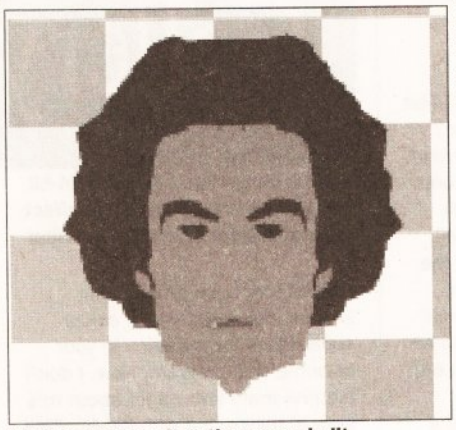
The most basic lighting set-up consists of *one* light. Point it at the subject from next to the camera and a flat, insipid scene results. Move it slightly upwards and to the side of the camera and we see shadows and depth appear. This light is usually referred to as the 'Key' Light. It is the brightest and most important lamp, producing the main light. By moving it around special effects can be obtained which accentuate shadow and depth, but which can result in a stark, unnatural look.

THE FILL

To reduce any harsh effects a second light is generally placed to soften any heavy shadows and reveal detail concealed by them, without removing their modelling effect. Not surprisingly, this light is termed the "Fill" Light and it is often placed fairly symmetrically to the Key Light, but across the Camera-Subject axis and it is set at around half to a third of the power of the Key so as not to overpower its effect.

THE BACK LIGHT

In the real world, where most actors have real hair, a back light is often placed behind to add highlights to the hair and fill out unwanted shadowing. In the 3D world it's unlikely the actors will have any hair at all, never mind 'real' hair, so the role of the Back Light is to add edges and highlights, removing more unwanted shadows.



What happens when the scene is lit just with ambient light. Yuck!

AMBIENT LIGHTING

Ambient lighting is the last main constituent. In the real world ambient light – usually daylight – is balanced across a scene by large reflectors or powerful lights. In the 3D world ambient light can be used to add a touch of fill to areas not affected by the other lights. If ambient light is used as the sole light source the scene will appear flat and featureless, because it will be illuminated evenly from every direction.

OTHER LIGHTS

If your software allows the addition of custom-built or special lights such as spots, cylinders and diffused lights, so much the better. Take time to experiment, as lights can make or break a rendering or animation.

Remember that adding lots of lights will increase rendering times, even with an accelerator. For instance, the five images here took 9 minutes 51 seconds, 8:47, 13:57, 12:44 and 5:42 to render in 24-bit with *Imagine 2* at a size of 160 x 128 using an Amiga 2000 equipped with a 40MHz 68030 card with maths co-processor and 4Mb 32-bit RAM. It would take 5 times as long to render each in 24-bit hi-res overscan.

In the images you see here the Key and Fill lights were spherical, shadow casting and diminishing in intensity with distance. The Key was white and set to 500 units, while the fill was also white but set to 200 units. These lights behave similarly to the way real lights would. However, my Back Light breaks the laws of physics and neither diminishes with distance nor casts shadows. Such effects are only possible with 3D programs, and can simplify lighting setups.

There are many ways that 3D lighting breaks the rules – as you can't see the lights unless you make them visible. Try these techniques with any 3D program which allows the use of multiple lights. You might find yourself inspired. AS

RECOMMENDED READING:

***The Technique Of Lighting For Television And Motion Pictures* by Gerald Millerson. Twenty years old and still a classic!**

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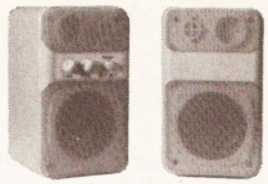
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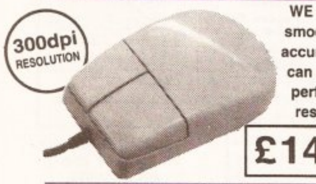


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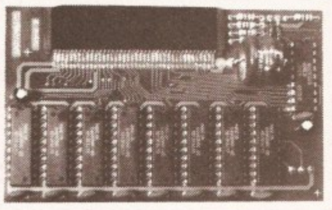
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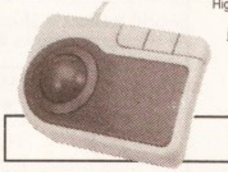
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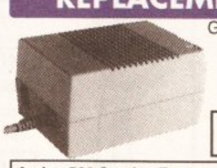
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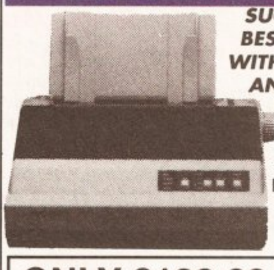
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Back to Back

Don't get the hump with MIDI... Paul Overaa reviews two great pieces of QuasiMidi kit and gives a guide to sequencer file conversion

Most MIDI event filtering and editing can be done by the sequencer either as the data is received or after the data has been stored. There are times however when it is quite useful to have external real-time editing of the MIDI data stream. Some Yamaha PSS synthesizer users for instance, namely those who suffer from the MIDI echo problem mentioned in previous installments, can benefit by filtering out data on specific MIDI channels. On the other hand you may simply want to add more sophisticated MIDI functions to your synthesizer or just be in a position to carry out more specialised filtering operations as and when particular situations demand it. One solution is to add extra hardware which allows you to manipulate the data coming from your synthesizer – the two QuasiMidi units I've chosen to look at this month are designed to offer just this sort of flexibility...

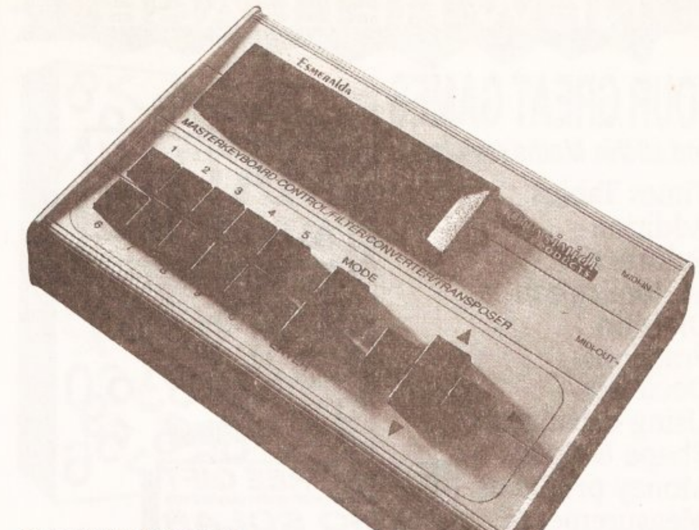
QUASIMIDI'S ESMERALDA

Esmeralda is a general MIDI toolbox unit which can function as a master keyboard controller, a MIDI filter, a MIDI converter and a MIDI transposer.The Esmeralda unit measures 170mm (length) x 110mm (width) x 35mm (height) and has a top panel which contains an LCD display plus a bank of editing and mode selection controls.

The unit itself is externally powered and requires to be driven by a 9v adapter, but an internal battery ensures that settings stored in Esmeralda's memory are retained The power switch, adapter power-in connector, and the MIDI In/Out terminals are all situated on the right-hand side panel.

As far as use goes, Esmeralda provides quite a range of master keyboard options, program change transmission, channel conversion, MIDI filtering, velocity curve and transposition facilities. Esmeralda's master keyboard function, for instance, enables you to add facilities that are normally only found on the more expensive synthesizers and master keyboards. For a start it enables you to define the upper and lower note limits of four overlapping zones and this effectively allows you to split your keyboard into four totally different sections (up to 128 named master programs can be created which specify a zone, a MIDI channel, a note range and a program change number). The net result is a substantial increase in flexibility: Data from a single incoming MIDI channel could, for instance, be split into zones which are then automatically rechanneled and used to control four separate synthesizers or expanders.

Very often you'll find that although you have transposed your MIDI keyboard the expanders remain in the original key. Esmeralda can solve that problem by changing all four zones to the key of your choice – in other words, it will read your channel-specified incoming data, possibly split the data (according to your chosen program) and then transpose each zone by the required number of semitones. Another useful function is the dual channel conversion. At any one time you can convert any two MIDI channels into two other channels.



QuasiMidi's Esmeralda provides some excellent real-time editing/filtering facilities

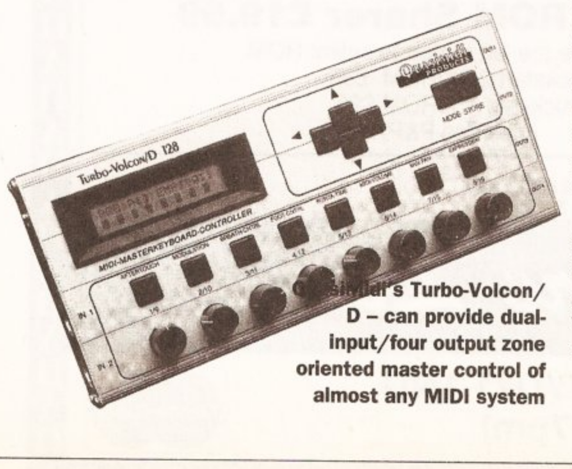
DATA FILTERING

Esmeralda's data filtering options are similar to those found on most sequencers but of course in this case the data is filtered out as the MIDI messages pass through the unit. MIDI velocity, program change, pitch-bend, channel aftertouch can be filtered out as can mod-wheel, breath controller, and other controller messages. All notes off, active sensing and MIDI clock messages can also be removed.

Admittedly, not all facilities are useful to all users (velocity curve facilities for instance are provided but these are only of use if you have a touch sensitive keyboard).

On the whole however there are sufficient built-in goodies to make the unit generally useful and a

continued on page 79



QuasiMidi's Turbo-Volcon/D – can provide dual-input/four output zone oriented master control of almost any MIDI system

JARGON BUSTING • JARGON BUSTING

Editing/Filtering – To edit means to alter, to filter means to remove. There are however a few variant terms that do cause confusion: Real-time editing means performing editing and filtering operations at the time the MIDI messages are flowing through the unit doing the editing. Some sequencers provide pre-record edit/filter options in which the sequencer alters or removes certain events (in real-time) prior to storing them in a sequence. Editing a sequence after it has been recorded is then usually called post-record editing. Direct data file sequence editing is another term you'll encounter from time to time – some utility programs can read and change sequences directly from the data stored as a disk file.

Event – Most events are basically a sequencer's equivalent of a MIDI message with other information, such as an 'event time' tagged on. Sequencer files usually contain sequencer-specific non-MIDI events as well (for representing things like cue marks, transposition details, tempo settings and so on).

External Clock – Sequencers can either use their own internal timing routines or get their timing from MIDI messages (known as MIDI clocks) inserted into the MIDI data stream by some external unit (such as a drum machine or another sequencer). In these latter cases the sequencer reading the data is said to be using an 'external clock'.

File header – Some initial information provided at the start of a data file.

Remapping – In the MIDI sense this means either changing all occurrences of one event value to another (as in the case of drum note remapping) or changing one event type to another.

Roland MT32 – A popular early Roland expander unit which provided drum facilities.

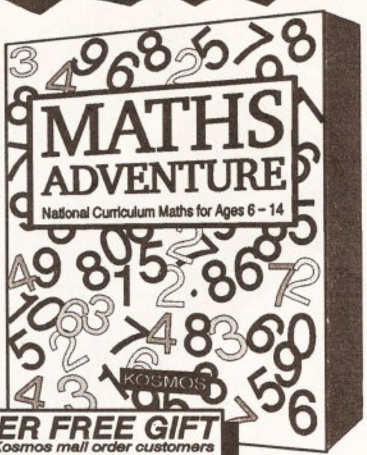
Yamaha RX21 – One of Yamaha's early drum machines.

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continued from page 77

number of nice extras, such as a tempo mode which allows you to display the tempo of the incoming data in beats per minute and sysex facilities for dumping and loading Esmeralda's internal settings.

QUASIMIDI'S TURBO-VOLCON/D

The Turbo-Volcon/D is another sophisticated QuasiMidi unit which permits up to eight independent, overlapping, keyboard zones distributed between two MIDI keyboards. Two MIDI-INs and four MIDI-OUTs are provided and the main use of the unit is as a programmable zone-splitter/MIDI-router come real-time performance controller. Sizewise it's a little larger than the Esmeralda unit (255mm (length) x 110mm (width) x 35mm (height)) but it follows the same basic design ideas built around the manipulation of menu selected items identified on an LCD display. Again a 9v power adapter is required and internally stored data is protected by an internal battery.

The Turbo-Volcon/D also has 128 master program slots and for each zone of a master program you can set slave assignment, keyboard zone, slave program number, MIDI volume, a transposition value, controller, velocity split and velocity-curve characteristics.

DIALS FOR DESIGN

Eight rotary dials control aftertouch, modulation, breath control, portamento time, MIDI volume, pan and expression characteristics and the current levels can be displayed on a bar graph for all 16 channels. The Turbo-Volcon/D also features an 'easy program' facility which allows sysex messages to be transmitted for a large number of popular synths.

Obviously this type of unit is designed with serious users in mind and you would need a fairly comprehensive MIDI set-up before many of the facilities became really useful. Nowadays however many MIDI musicians do build up quite sophisticated MIDI studios and obviously in these situations the extra facilities provided by intelligent MIDI editing and controlling units, such as those offered by QuasiMidi, do become very useful.

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SEQUENCER FILE CONVERSION

Paul Overaa takes a look at MIDI event editing with a scheme aimed at the programmers out there

Despite the fact that most sequencers use different internal file formats, it has become increasingly easy to read MIDI data across from one sequencer to another. Even if you have a sequencer that doesn't allow MIDI file sequence import and export all is not lost... you borrow a second machine, join them with a MIDI cable then 'play' one sequencer whilst you record with the other. Providing you make sure that the sequencer which is recording is set to read external clock data you'll have new files with the same bar alignment as the original files.

Prior to GS type standardisation, which we discussed last month, some sequence editing was usually required when using other people's sequences and similarly a change in synthesizer or addition of a new expander unit also meant that a few program change numbers or controller values would need to be altered. Most users can do this directly from their sequencers but there are times when, because of either sequencer editing limitations or because of the sheer number of sequences that need to be altered, some alternative approach needs to be found.

Suppose, for example, someone gives you some disks containing hundreds of sequences but in order to use them you need to perform some global editing operations on *all* of the sequences (using the one-by-one approach required by most sequencer programs can take a lot of time). In trying to solve problems like this we enter the domain of experienced users who can solve any editing or portability problem that comes along – in other words we enter the domain of the true MIDI/music hacker!

STANDARD STRUCTURES

In previous installments I've talked about aspects of MIDI/music related standards and file structures but I've kept clear of any mention of proprietary file structures, ie the sequencer-specific internal formats, used by sequencer manufacturers. It's worth knowing however that the structures of many of these internal formats are far simpler than, say, that of a standard MIDI file – this means that the job of writing a utility to perform some specific editing of an internal sequencer file format is usually much easier than writing, say, a generalised MIDI file editor.

The reason I'm mentioning this is that, occasionally, sequencing snags can arise in which the easiest solution is to write your own editing software! Direct remapping of drum parts when large numbers of sequences are involved is one case which comes to mind because most drum machines differ in the types of drum sounds they produce and, more importantly, in the note-drum assignments used. If, for example, you send a Yamaha RX21 drum unit a C4 MIDI note it will play a crash cymbal... the same note sent to play percussion on a Roland MT32 unit produces a 'High Bongo'. Although it's useful to have drum units that offer user-definable drum assignments, this doesn't help if, for instance, you want to use a song that someone else has arranged for use with a drum machine that is different to yours.

NO GLOBAL EDITING

To the best of my knowledge, no sequencers on the Amiga allow you to perform automated global edits on batches of sequence files. Writing your own file modification utility

EXAMPLE OF A SIMPLE MIDI NOTE REMAPPING UTILITY

```
/* some defines... */

#define BUFFERSIZE 10000
#define EVENT_TYPE 0x99

/* This program is a hack not a general utility and
in this example we're looking ONLY for notes on
MIDI channel 10; hence, the EVENT_TYPE shown above
is a channel 10 NOTE-ON status byte */

#include <exec/types.h>
#include <exec/memory.h>
#include <libraries/dos.h>

BOOL LoadBuffer(TEXT *, UBYTE *, LONG);
BOOL SaveBuffer(TEXT *, UBYTE *, ULONG);
struct FileHandle *Open(TEXT *, ULONG);

struct Header {
UWORD SequenceID;
ULONG EventCount;
UBYTE SequenceName[8];
};

struct Event {
UWORD Time;
UBYTE Type;
UBYTE Note;
UBYTE Velocity;
UBYTE Duration;
};

UBYTE  buffer[BUFFERSIZE];
/* Sequence data buffer */

UBYTE  note_table[128];
/* Note conversion table */
struct Header *header;
struct Event  *event;

main(int argc, char *argv[])
{
UCOUNT i;

/* The  note_table[] array contains changes that
are to be made to the existing drum assignments.
The i'th element of the array holds the new value
for a note of value 'i'. Notes whose values are to
be left unchanged are simply re-assigned as the
same value. */
```

continued on page 80

might seem like a last resort approach, but once you have understood the principles you'll realise that all such programs follow a similar pattern and this means that, once you've written one such utility, other related programs will be straightforward to create. In fact if you stick to creating short utilities which do specific jobs (rather than trying to write all-singing-all-dancing versions which cater for more general editing possibilities) you'll be surprised how easy it is.

EXAMPLE EDIT PROGRAM

This month I want to sketch out the ideas behind a typical edit program and the easiest way to do it is to look at an example: what, for instance, would we have to do to remap the drum assignments of a drum part present in a sequencer file? Firstly, we would have to read the data file. Secondly, it would be necessary to identify all of the notes of the designated drum channel and change these note values to the new values. Lastly the modified file would have to be saved.

The biggest problem is usually getting the file format information in the first place. Given sufficient time, and the right combination of luck and common sense, you can 'hack' your way into the file structure and build up your own 'picture' of how the data is stored. In short the best first step is usually to contact the company concerned, explain what you are trying to do (and *why*), and see whether it has a policy of releasing details of its internal file layouts.

I've chosen a Dr T's KCS based example because there are a lot of KCS sequencer users who, not having sufficient memory to run the new MPE-orientated level II offering containing the PVG/master editor program, are still using earlier versions of the KCS package. Drum part remapping is not easy so this is one example where a user with some programming experience might find it useful to write his own editing utility.

To provide an example file structure I contacted Dr T's in the States and asked for details of their KCS .SEQ sequence files. Back came the reply with the necessary details: Firstly, an .SEQ file has a 14 byte file-header arrangement...

2 bytes	An ID value
4 bytes	No of events in the file
8 bytes	Sequence name

After the header comes the list of 'events'. Each 'event' is 6 bytes in length and those which are of interest are the ones which turn notes on. The format is as follows...

2 byte	event-time	
1 byte	event-type	
1 byte	note-value	7 bits used
1 byte	note-velocity	7 bits used
1 byte	note-duration	10 bits used

The event-time doesn't concern us. Event-type for a 'note-on' event turns out to be a MIDI note-on status byte. The remaining three bytes are a bit more tricky... note and velocity data values only need 7 bits, so the high bits of these bytes are used to store a couple of extra note-duration bits, ie the duration is actually stored as a 'broken' 10 bit field.

Now we can see what needs to be done to to write the remapping utility: firstly we must read the file into memory and look at the header's event count to see how many events need to be dealt with. Having done that we look at each event and, providing it is a 'note-on' event on the right MIDI channel, we convert the existing note value to the required new value. Before converting a note we check bit 7 to see if it is set – if it is we preserve it so that we don't inadvertently change the event's duration.

In the example program I've defined header and event structures based on the .SEQ file details. The use of C structures to mirror the inherent file structure helps to keep the code uncluttered...

For the example I've used a note table which will perform a Yamaha RX21 -> Roland MT32 conversion. The MT32 has a more drums than the RX21 so I had to decide on a suitable MT32 drum sub-set to use – here is the correspondences that I opted for...

Drum/RX21 note/Chosen MT32 converted note

Bass Drum	45	35
Tom 3	48	43
Tom 2	50	45
Snare	52	38
Tom 1	53	48
HandClap	54	39
Closed Hi-hat	57	42
Open Hi-hat	59	46
Crash Cymbal	60	49

In the program on page 79-80 you'll see these MIDI note values set up in a 'note_table[] array and it's this that you would alter to produce alternative remapping arrangements. The example has been written in C and runs from the CLI/Shell, but the essential ideas of the program would be similar in any language on any computer. To use this offering you'd type three parameters... the program name, the source sequence name, and the destination sequence name, The command...

REMAP DFO:TEST.SEQ
RAM:MODIFIED.SEQ

for example, would read the file TEST.SEQ into memory, make the conversions, then write the modified data as a file called MODIFIED.SEQ into the RAM-disk device.

These types of editing programs are not difficult to write and, coupled with utilities like *Lattice/SAS*'s build/extract etc, it is easy to create script files which will use such utilities to edit batches of sequencer data files. The example I provided concerned drum part remapping but the basic ideas can be used to create programs capable of editing any number of event characteristics.

Similar programs can be written to alter standard MIDI files but, because of the more complicated file structures, the programming does get rather more involved. AS

continued from page 79

```
for (i=0;i<128;i++){note_table[i]=i;}

note_table[45]=35; /* BASS DRUM */
note_table[48]=43; /* TOM-3 DRUM */
note_table[50]=45; /* TOM-2 DRUM */
note_table[52]=38; /* SNARE DRUM */
note_table[53]=50; /* TOM-1 DRUM */
note_table[54]=39; /* HAND CLAP */
note_table[57]=42; /* CLOSED HI-HAT */
note_table[59]=46; /* OPEN HI-HAT */
note_table[60]=49; /* CRASH CYMBAL */
if(argc>2)

{
if(LoadBuffer(argv[1], buffer, ↵
BUFFERSIZE)==FALSE)

{

header=(struct Header *)buffer;
event=(struct Event *)(buffer+sizeof ↵
(struct Header));

for(i=0;i<header->EventCount;i++)
if (event->Type==EVENT_TYPE)
{
if (event->Type&0x80)
{
event->Note=note_table[event->Note]|0x80;
}
else
{
event->Note=note_table[event->Note];
}
}
event++;
}

SaveBuffer(argv[2], buffer,
sizeof(struct Header)+header->EventCount*
sizeof(struct Event));

}
}
}

BOOL LoadBuffer(TEXT *filename, UBYTE ↵
*buffer_p, LONG buffersize)

{
struct FileHandle *fh;
BOOL error_flag=FALSE;
if((fh=Open(filename, MODE_OLDFILE))==NULL)
{
error_flag=TRUE;
}
else   {
if(Read(fh,buffer_p,buffersize)<0)
{
error_flag=TRUE;
}
Close(fh);
}
return(error_flag);
}

BOOL SaveBuffer(TEXT *filename, UBYTE ↵
*buffer_p, ULONG data_size)
{
struct FileHandle *fh;
BOOL error_flag=FALSE;
LONG length;
if((fh=Open(filename, MODE_NEWFILE))==NULL)

{
error_flag=TRUE;
}

else {
length=Write(fh,buffer_p,data_size);
if(length<0) {error_flag=TRUE;}
Close(fh);
}
return(error_flag);
}
```



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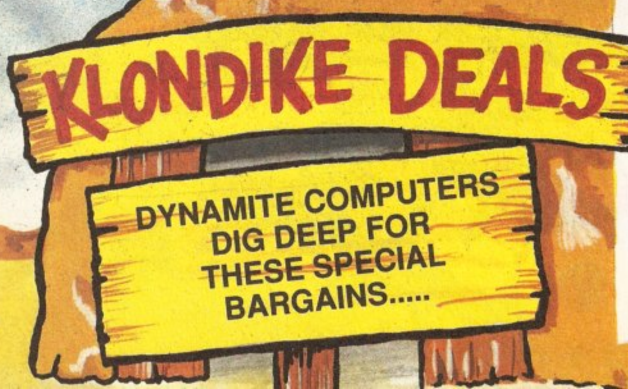
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AMOS ANSWERS

'Doctor' Jason Holborn prescribes a few more cures for your AMOS problems

GAMES PROBLEM

Having typed in the listing in the June issue of *Amiga Shopper* for the Shoot 'em up game that you are covering within the AMOS column, I find that I cannot get it to either scroll the screen or control the spaceship bob. Sometimes I get a split second image and the program ends or an error is thrown up. What's going on?

Rod McLaren
Peckham, London

Err, yes Rod. You are of course correct in stating that the listings which I've used to demonstrate the games programming feature don't actually run. The reason for this is simple – they aren't meant to. They're really nothing more than 'skeleton' routines which have been written in such a way that they can quickly and easily be incorporated into your own AMOS code. As a result, it's up to you to write the code that pulls them all together. Even then, they'll definitely need to be adapted a little to suit your own requirements.

Ideally I would have liked to have published the listing for an entire game, but it's not really possible. After all, a game doesn't just consist of code – external graphic and sound files need to be pulled in at runtime to make something appear on your Amiga screen. Even if we printed all the code, it would fill up quite a few pages and would be a real drag to type in.

I personally felt that the feature would be of greater value if it required some thought on your part – after all, getting the code up and running is all part of the exercise! ***JH***

YOUR MOVE!

I am currently writing a Chess game using AMOS 3D. I want to display all the chess pieces and the board as 3D objects. I will therefore require a maximum of 33 objects to be displayed on screen at once. Is this possible with AMOS 3D? If so, how much would it affect the speed of my game if such a large number of objects were to be displayed?

The only solution that I can come up with is to use the Td Redraw command twice without calling Td Cls. This has proved to be impractical as it would halve the speed and I would have to decide which objects to draw and when to give the correct perspective. Can you suggest a better solution?

Andrew Swallow
Rossendale, Lancashire

I think you're making life very difficult for yourself by using AMOS 3D for a chess game. For starters, AMOS 3D cannot display more than 20 objects at any one time (object 0 is always your viewpoint), so you're going to have to use a bit of jiggery pokery to get all the pieces to display. The only solution I could think of was to draw each of the pieces as they should appear on a separate screen, grab them out as bobs and then paste them down as you would a conventional bob turning off the 3D object as soon as it has been grabbed. When you need to move a piece, the entire board will need to be redrawn though – not exactly an ideal solution, but at least you keep the perspective.

A much faster (and simpler) solution would be to forget about AMOS 3D altogether and use nothing but blitter objects. When a piece is moved, simply modify the bob priority so that it is displayed in front of all others and when it is placed, decide which bobs should be in front of it and which should be behind it. Although the perspective will suffer, you'll find that even commercial chess games such as *ChessMaster 2000* use this technique. ***JH***

DROPPING SCROLL

When using the Screen Offset command in AMOS for horizontal

➠ ➠ ➠ ➠

AMOS ACTION

Jason Holborn continues his journey into the world of AMOS with a look at the techniques involved in programming 3D games and how to get your screens running in sync...

Welcome to AMOS Action, the liveliest and most authoritative column dedicated to AMOS Basic. Over the next four pages you'll find crafty cheats and clever tricks to help you get the best from what is undoubtedly the most powerful Basic implementation on any computer platform. Although my name sits at the top of this page, this column isn't just the work of a single writer – to bring you the best, we regularly draft in the services of some of the most knowledgeable AMOS experts in the industry.

For experienced programmers, we continue our feature on programming games in AMOS. This month we take a look at how to write a game using AMOS 3D, Voodoo software's excellent 3D extension. If all that techie talk is beyond you though, you'll no doubt find our AMOS for beginners section a real godsend. Designed to unravel the mysteries of AMOS which the manual doesn't quite explain too well, AMOS for beginners is guaranteed to be virtually jargon free.

Continuing the traditions of the *Amiga Answers* section of *Amiga Shopper*, the AMOS column has its own help line in the form of AMOS Answers. If a problem is causing you to tear out all your hair, let us put your mind (and scalp) at rest by answering your problematic prose. As you can see, AMOS Action is *the* column to read.

OOPS CORNER

I must just take this opportunity to say a big sorry to Sandra Sharkey for virtually writing her obituary in issue 16 of *Amiga Shopper*. As reported, although Sandra has ceased to handle the AMOS PD library, she would like me to point out that she continues to handle her own very successful licenseware scheme. For more information on this excellent range of disks, Sandra can still be contacted on 0942 495261.

WHAT'S YOURS CALLED?

Everyone knows that AMOS is capable of producing a lot more than games and demos. According to the lads at Europress Software, AMOS is being put to the most unusual of uses. If you've developed an application using AMOS which is a little out of the ordinary (an emulator, for example), why not write in and tell me about it. Even better, send me a copy of the program and a screenshot of it may even appear within these very pages.

Send your disks to the usual address marked for my attention. I tend to hoard disks, so if you want to see your disks again... don't forget to include a stamped addressed envelope. If you don't, they may end up spending the rest of their working lives at the bottom of my disk box!

SWAG BAG CORNER

Thanks to a group of light-fingered inhabitants in my home town of Trowbridge, the column you're reading nearly never made it to print. Whilst I was soaking up the sun on holiday (the card's in the post!), some 'upstanding citizens' decided to help themselves to my Amiga system.

Somewhere, someone is having the time of their life playing around with an Amiga A3000, an A1000 (my heart broke when I realised that my treasured A1000 had gone walkies) and the keyboard from my B2000. The most annoying thing is that they walked off with a library of AMOS routines which I had built up over the years. Is nothing sacred?

scrolling of a single screen, the screen drops down 1 pixel at the end of each scroll – how do I avoid this?

Paul Jones
Leeds

Ah, a nice simple question. The reason why your scroll is dropping down a line when it reaches the end of the superbitmap is because you are scrolling past the end of the bitmap.

As you will know, hardware scrolling works by looping an area of screen memory. If you try to loop past the end of the superbitmap, AMOS will display the start of the bitmap again, but it will lose the top line.

To understand why this is happening, you need to understand how screens are held in the Amiga's memory. If you have a superbitmap that is 640 pixels wide and 256 pixels in height, then it would be stored in memory as a continuous stream of 256 groups of 80 bytes (there are 8 bits in a byte, so 80 bytes would give 640 individual bits) starting with the bit at screen position 0,0 and ending with the bit at position 640,256.

In order to scroll a screen horizontally, you need to pass the screen offset command a number which specifies the horizontal offset from the screen origin (pixel 0,0).

When the screen scroll reaches position 640,0, it is reset to 0,0 and the loop begins again. If the offset value is larger than 640, AMOS will start reading the screen image from the second group of 80 pixels (which is basically the second line of the display).

Because the first line of code is effectively being ignored, the display will be only 255 lines high resulting in the 'drop' effect which you have described in your letter. To avoid this, make sure that the offset value is never larger than the maximum size of your bitmap.
JH

HELP!

If you've got a problem with AMOS, then AMOS Answers is here to help you.

Send in any of your problematic prose to: AMOS Answers, *Amiga Shopper*, Future Publishing Ltd, 30 Monmouth Street, Bath Avon BA1 2BW.

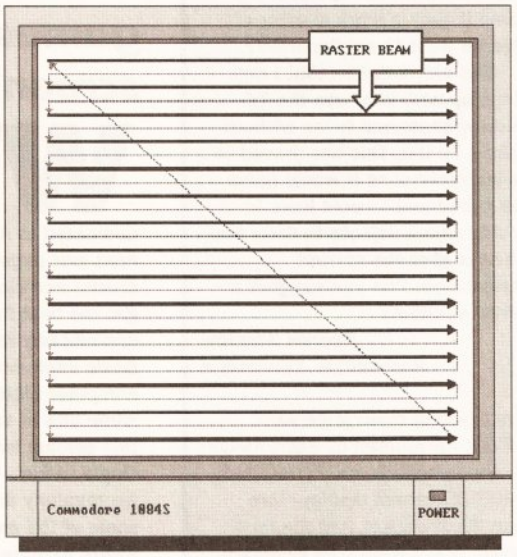
AMOS FOR BEGINNERS

SYNC OR SWIM

We've covered some pretty complex subjects in the past three months. By now you should be able to open a screen in any of the Amiga's screen formats, scroll entire screens smoothly using both hardware and software scrolling techniques. This month we take a look at screen synchronisation, a subject which doesn't produce anything particularly interesting, but is very important nonetheless.

Before we go any further though, let's take a look at the theory behind screen synchronisation. Don't worry about getting bowled over by jargon – it's actually a very simple principle which should help you to understand why it is so important.

As you are probably already aware, the Amiga's display is redrawn every 50th of a second (or every 60th of a second on NTSC Amigas) using an electron beam which scans from the top left hand corner down to the bottom right hand corner of your monitor, drawing each horizontal line of the display as it goes.



The Amiga's display is drawn on to your monitor using an electron beam which scans from left to right down the screen fifty times a second. When it reaches the end, it is switched off and then reset to the top left hand corner

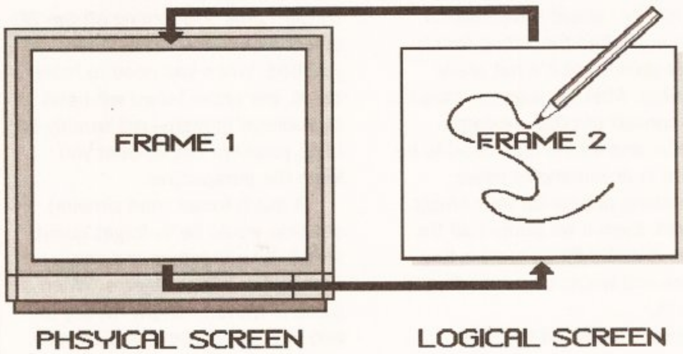
BEAM ME UP

When the beam reaches the bottom right hand corner of the display, it is switched off and then reset to the top left hand corner and the process then begins again. The time period during which the beam moves from the bottom right hand corner back to its start position is called the 'vertical blanking period'.

FLICKER FIXER

Even the fastest of computers can't quite handle the task of updating a screen completely during this blanking period, so programmers cheat by using a system called 'Double Buffering'.

Double buffering is actually a very simple process – instead of performing your drawing operations on the image that is currently being displayed (the physical screen), they are actually performed on a copy of the screen which is invisible to the user (this is called a logical screen).



Double buffering in action. Whilst frame 1 is being displayed, the next frame is drawn into the invisible logical screen. Once completed, the screens are swapped as soon as the vertical blanking period is reached. This process is performed over and over again ensuring flicker free movement on screen

Once the drawing operations are complete for that particular frame, the physical and logical screens are then swapped. In effect, the old physical screen becomes the new logical screen and vice-versa.

It's very important however that when the screens are swapped, they are only swapped during the vertical blanking period. If they were to be swapped at any other time, a visible flicker would appear as the Amiga would be attempting to draw half of the physical screen and half of the logical screen. Thankfully AMOS provides a series of simple commands which enable you to remove flicker almost completely.

> ***"Even the fastest of computers can't quite handle the task of updating a screen completely during the blanking period."***

The process of setting up a double buffered display can be automated completely by issuing the 'DOUBLE BUFFER' command as soon as the screen is opened.

The process of swapping screens is then automatically handled by AMOS. Sometimes it's not particularly practical to swap the screen every 50th of a second because some drawing operations

(updating a 3D display, for example) take longer to complete. Automatic screen swapping can therefore be turned off with the 'BOB UPDATE OFF' command. It's also necessary to turn off AMOS' AutoBack feature (this basically copies your drawing operations onto both the physical and logical screens) using the 'AUTOBACK OFF' command.

You can then perform all your drawing operations on the logical screen at your own rate and then perform the screen swapping operation manually using the 'SCREEN SWAP' command.

Finally, we need to use the 'Wait VBL' command to tie the screen swap operation in with the vertical blanking period. Once this is done, the whole process can be repeated over and over again producing a flicker free display.

SCREEN SWAPPING

Anyway, that's enough theory – try entering the following listing which demonstrates screen swapping in action.

```
' ** Screen Sync Demo **
' ** Written by Jason **
'
Screen Open ↵
0,320,256,32,Lowres
Cls 0
Double Buffer
Bob Update Off
Autoback 0
'
Ink 2
Do
For COUNT=-50 To 322
Ink 0
Box COUNT-2,100 To ↵
COUNT+48,50
Ink 2
Box COUNT,100 To COUNT+50,50
Screen Swap
Wait Vbl
Next COUNT
Loop
```

The listing above doesn't do anything particularly spectacular, but it serves as a very good demo of synchronising screen redraws using double buffering and screen switching.

If you want to see what the demo would look like without synchronisation, then try removing the line that reads 'Wait VBL'. You'll notice a rather terrible flickering.

One thing to note is the first box drawing operation. You'll notice that it draws a rectangle in the background colour at exactly 2 pixels back from the current value of COUNT despite the fact that the loop counts up in single increments. This is necessary because we're actually dealing with two screens here. As a result, the Box command is used to remove not the last box that was drawn, but the one before it. It's important to remember that the last box which we drew is still being displayed whilst the drawing operations are taking place so we're actually removing the contents of the current logical (hidden) screen.

KEEP TRYING

Don't worry if you're still a little confused. As with all things in life, enlightenment doesn't really come until you've got a bit of experience under your belt.

Try writing a couple of demos yourself which use screen synchronisation. You'll find that all this theory eventually falls nicely into place.

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Flicker Fixer – A device which removes the flicker from the Amiga's interlace mode and the visible scan lines in non-interlace mode.

Interlace mode – This is the Amiga's way of doubling the vertical screen resolution, but normally by effectively halving the screen update rate and thus creating flicker.

NTSC – National Television Standards Committee. This is the name for the TV colour coding system used in the USA and other countries. It has 525 lines, running at 60 fields and 30 frames per second.

Double buffering – A system used to avoid flicker during animations. Screen information is held in memory, and any changes in memory result in changes to the display. In the case of a double buffered screen, two images are held in memory. Changes are made to one image while the other is being displayed. Once the changes are complete, that screen is displayed and the other is hidden.

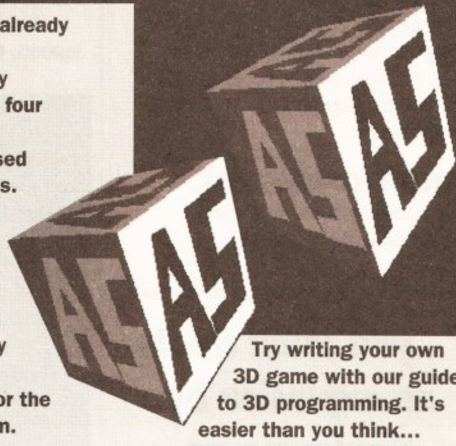
Bob – A blitter object or software sprite. A graphics object which is moved around the screen by the part of the Agnus chip known as the blitter.

Loop – A programming concept which enables a programmer to get the same piece of program to execute several times.

GAMES PROGRAMMING

3D Games

As you'll no doubt already be aware, games software basically breaks down into four distinct groups – puzzles, adventure games, sprite-based arcade games and 3D games. With the recent release of AMOS 3D, AMOS programmers can now write games that fall into all four of these categories. Indeed, AMOS now provides possibly the most comprehensive programming environment for the average user on any platform.



Try writing your own 3D game with our guide to 3D programming. It's easier than you think...

DIFFERENT PERSPECTIVE

We've covered the more traditional forms of games software in quite some detail within these pages, so I thought it was about time we turned our attention for a brief moment to the subject of programming in 3D. 3D graphics can be very confusing, but – thanks to the programming prowess of Voodoo Software (the development team behind AMOS 3D) – AMOS 3D makes this task child's play.

If you haven't already bought AMOS 3D, then you just don't realise what you're missing. I was very lucky to have been sent a complimentary copy by those nice people at Europress when the package was first released, so I've had a few months in which to appreciate fully the power of this wondrous add-on. You may well think that 3D is beyond you, but take my word for it, AMOS 3D is an absolute joy to program under.

Obviously it would be impossible to detail how to write a game in 3D with the kind of depth that the subject deserves, so I thought I'd generalise a bit by taking you step by step through the process detailing as many of the more important instructions as space will allow.

DESIGN DECISIONS

The first step in writing any game is to decide upon exactly what you want to write. It's very important at this stage to remember the limitations of both AMOS and the 3D extension when designing your game or you may well end up running out of processor time and 3D objects before the game has even started to take shape.

AMOS 3D provides you with basically 21 objects to play with, although only 20 can technically be used (object 0 is your viewpoint). Don't forget also that objects within AMOS 3D cannot contain more than eight individual 'primitives' (8 cubes, for example), so don't

> *"Having all your objects floating in a black void is OK for space games..."*

expect to be able to produce massively complex spaceships etc.

Don't try to be too adventurous if this is your first outing with AMOS 3D either – there's nothing more off-putting than having to throw in the towel half way through a game because you're trying to write a game that is beyond your programming talents. Stick with something nice and simple – a 'tailgunner' game is a nice example.

Once the game design is finalised, you can then move across into AMOS 3D's OM Object Modeller and start pulling your 3D objects together. At this stage it's well worth sitting down and designing your 3D objects on paper

before you attempt anything within OM. This will save you a lot of time that would have been wasted just tinkering around with ideas. Experimentation doesn't hurt of course, it's just that it is all too easy to spend hours just experimenting and not actually produce anything (I do it all the time!).

3D MADE EASY

Once all your objects have been designed and safely saved off to disk, the next step is to quit OM and load up the workhorse of the whole affair, AMOS.

SYNCHRONISATION

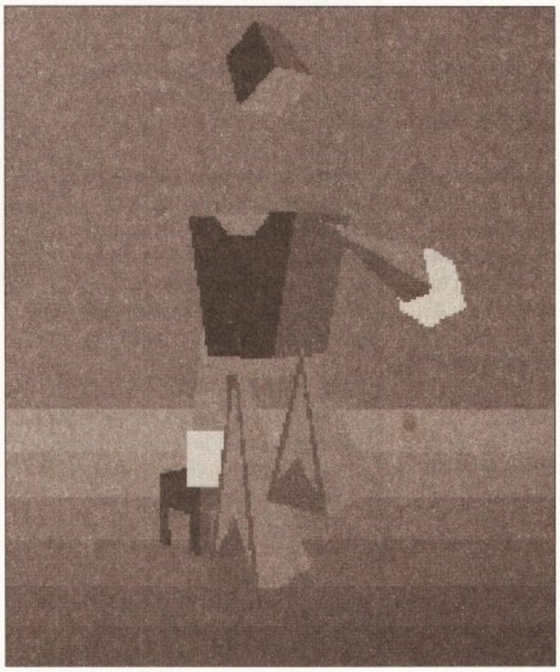
As discussed in the beginners section this month, screen synchronisation is very important indeed (especially when working with 3D), so the first thing you should do is define a double buffered display. Drawing 3D objects takes time (even with the Amiga's powerful blitter chip doing all the work!), so a double buffered display will remove all flickering that would normally appear if only a single screen was used.

> *"...you could create an explosion by displaying an animated bob."*

Having all your 3D objects floating in a black void is OK for space games, but even then you may want to add a little bit more depth by dropping in an attractive background. This can be any IFF image but it's best to restrict your backgrounds to only a few colours. The command to make it all happen is 'Td BACKGROUND'.

Now that the screen display has been correctly configured, the next step is to load in your bank of 3D objects using the 'Td LOAD' command. Note however that this doesn't actually display your objects – all this command does is load all the objects into the appropriate memory bank ready for use. It's no different from loading a sprite file really.

Once the objects have been loaded, they can now be displayed.



Object modelling is used to construct all the objects that will inhabit your 3D universe

Because the 'Td LOAD' command only supplies a pointer to your 3D object bank, it's perfectly possible to use the same 3D object over and over again within the same display simply by giving each on-screen object the same pointer to the 3D data held in memory. You could, for example, have a whole fleet of spaceships all of which share the same object data. This is quite a handy facility really as it removes the need to define each object separately.

Up to 20 objects can be displayed on-screen at once using the 'Td OBJECT' command. Not only does it turn on the object, but it also tells AMOS 3D where in 3D space the object should be located expressed as a set of 3D co-ordinates (X,Y and Z). To actually view the objects, call the 'Td REDRAW' command and then swap the double buffered screen using the 'SCREEN SWAP' command and they'll appear.

Another very important object that you must define is your viewpoint which is actually an object itself (object 0, to be precise). Your position in 3D space can be set in exactly the same way as detailed above using the 'Td OBJECT' command.

The direction of view can also be set using this command by setting the VRU (Voodoo rotation units) parameter to a value between 0 and 65536. If you need to calculate this in degrees, simply multiply the angle in degrees by 182.

ON THE MOVE

If you've followed all the instructions above then you should be looking at a very nice 3D display. Problem is though, it isn't actually doing a lot at the moment. Thankfully AMOS 3D supplies a wealth of commands which will enable you to breathe life into your 3D creations. The most commonly used commands that you'll encounter though are 'Td MOVE' (or 'Td MOVE REL) and 'Td ANGLE'. Td MOVE moves the object in 3D space to a given position and Td ANGLE rotates the object around a set of axes based around the centre of the object (expressed once again in VRUs). More flexible than the standard form of 'Td MOVE' though is the 'Td MOVE REL' command that moves and object relative to its current position.

Using the same commands that we detailed in step 6, you can also move around in 3D space yourself. Because object 0 is always your viewpoint, you can move around and rotate your viewpoint using the very same object movement commands.

Another very powerful command in AMOS 3D's arsenal is the 'Td BEARING' command which can be used to get the co-ordinates of an object relative to another. Say, for example, you were writing an *Elite* clone and you wanted your ship to fire a heat-seeking missile at an enemy vessel. By continuously calling the 'Td BEARING' command and then moving the missile closer and closer to the moving object (simply move it faster than the object that it is chasing), the missile would eventually impact with its target. You could then create an explosion by displaying an animated bob.

BUMPER TIPS

Now that we know how to move objects around in 3D space, we need to be able to detect when they collide (how do we know when the missile above actually hit its target?). Obviously standard sprite-based collision detection routines aren't a lot of good when you're working with 3D (two objects that appear to be touching may actually be a long way from each other), so AMOS 3D supplies a couple of commands to handle collision detection in the third dimension.

The collision detection routines used in AMOS 3D are based around a system of zones (zones are like invisible force fields around an object). To detect collisions between two objects, you therefore need to define a zone for each object using the 'Td SET ZONE' command. The collision can then be detected by calling the 'Td COLLIDE' command. Whilst the system of zones is not perfect, it's good enough for the vast majority of 3D games.

THE NEED FOR SPEED

Finally, we need to be able to keep the frame update speed as fast as possible so it's worth taking advantage of AMOS 3D's ability to remove hidden objects until they are in view. The command that does this is 'Td VISIBLE'. What it does is check whether all the objects that are currently being used are actually within view. If they are not, then it tells the 3D engine not to bother to redraw them. If you've got lots of objects defined, using this command can speed it up considerably. If you don't believe me, try omitting it – I think you'll be amazed at the difference!

Well that's it – you now know everything you need to write a 3D game. You'll find that 3D games are actually simpler to write than conventional sprite-based games. Go on, give them a try. If you manage to produce something spectacular, then don't forget to send it in – I'd love to see what you can come up with! AS

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Object – An object or sprite is a graphical unit defined in a rectangular frame. It is made up of a number of colours, one of which is defined to be transparent, so that when the object is placed on the screen, the background image may show through underneath. By means of the Amiga's hardware, objects can be moved easily about the screen without disturbing the screen picture beneath them.

Sprite – A graphical shape, moved as a whole around the screen. The Workbench pointer is an example. Some sprites are manipulated by the Amiga's blitter, meaning that they can move very smoothly and rapidly, without erasing any of the information beneath them as they travel across the screen.

IFF – Interchange File Format is a means by which data from different graphics or sound sampling programs are saved in a compatible way. It enables data to be exchanged between programs very easily and avoids the situation, say, on the PC where dozens of different graphics packages each save data in incompatible formats.

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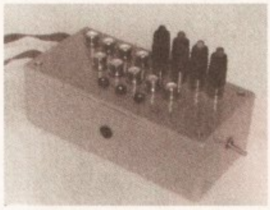

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This month we'll be taking a look at a shareware BBS system, 4D-BBS which for a mere $29.95 gets you a very powerful BBS system indeed.

First of all though, a look at a new *NComm* log file analyser, *LogInfo*, that I received recently. At first sight it seemed to offer little new, a closer look however produced some interesting surprises.

LOGINFO

LogInfo is written by one Sanjeev Massey from London. It's shareware, with a very reasonable registration fee of £10. The demo version is limited to 75 calls. While this wouldn't earn it much of a reputation among PC owners, I'm much more forgiving, and 75 calls is plenty to assess its value.

FIRST IMPRESSIONS

The first things you'll notice about *LogInfo* are the icons. They were designed for a Workbench 2.0 system which means they look horrible on a 1.3 machine, but progress cannot be avoided so, if like me you've only got 1.3, you'll have to put up with grotty icons until you upgrade.

The program comes with two document files. The first details the operation of the program in great depth including an explanation of how British billing is calculated, full details BT's unit scheme and details on how to modify the programs so that they can be used with other (foreign) types of billing in particular minute based billing (this option is ideal for people who use Mercury).

The software has an icon (a take off of the BT logo) and double clicking on it presents the first problem. A requester appears informing you that the reqtools.library is missing. Closing the requester crashes the machine requiring a reset.

It's at this point that you remember that you were supposed to install the library in your LIBS: directory. A script is provided though, so once you've done that everything runs hunky dory.

LOGINFO IN ACTION

When you run the program you get the usual reminder requester giving Sanjeev Massey's address and reminding you the program only costs a tenner.

Clearing the reminder gives you an almost blank screen with a set of gadgets at the top which provide access to the analysis routines and a collection of pull down menus giving access to the options available.

CHARGE BANDS

LogInfo provides you with up to 25 "Charge Zones", with each one having up to five time bands within each zone. This enables you to set up the various BT charge bands (local, a, b1 etc.) plus any international areas you may use.

LogInfo also enables you to set up a number of Bank Holidays when all day will be charged at cheap rate.

Once you've set up your charge bands (and *LogInfo* comes complete with our National ones already set up) you need to load a log file and set the charge bands for the boards contained in it.

ZONE ANALYSIS

Once you've set up the board zones you can proceed to analyse the data.

There are five ways of analysing the data, on a monthly, daily or hourly basis, an overall summary of the log file and a list of the boards you call in time, cost or alphabetical order.

WORDS OR PICTURES

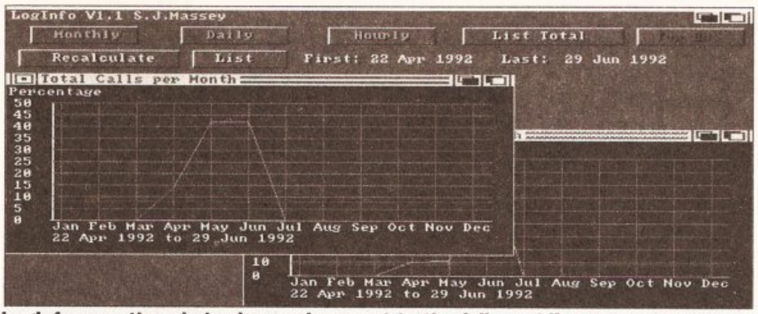
Each of the reports can either be text or graphics based, alternatively you can write the report to a file and therefore the printer.

If you choose to display a graph, you can show either time online, number of calls or cost over the selected time period. One of the nice things about *LogInfo* is that it has been written as a windowed program. This means you can have a window showing the cost per day graph next to a window showing the time online day graph. You can also view graphed reports and text based ones at the same time, to get a better view of the actual figures involved.

CONCLUSION

Put simply, *LogInfo* is one of the best UK shareware programs I've seen in a long time. The presentation is excellent and more importantly, a lot of thought has gone into making the program easy to use. At 10 quid it's a bargain and is ideal for stataholics, as well as people who are keen to keep an eye on their phone bill.

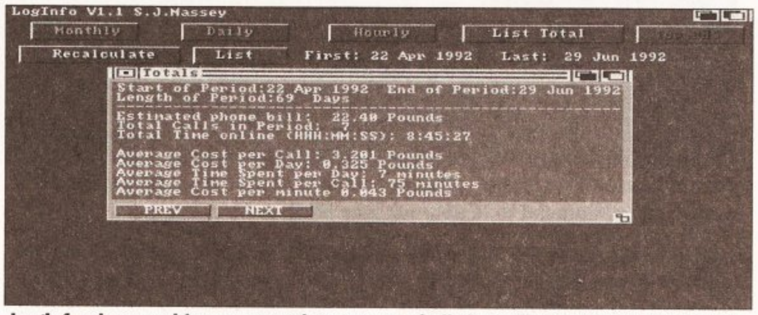
LogInfo should be available on a BBS near you, or alternatively write to S J Massey, 48 Selsdon Road, Upton Park, London E13 9BX.



LogInfo uses the windowing environment to the full, enabling several graphs to be viewed simultaneously

Biting the bulletin

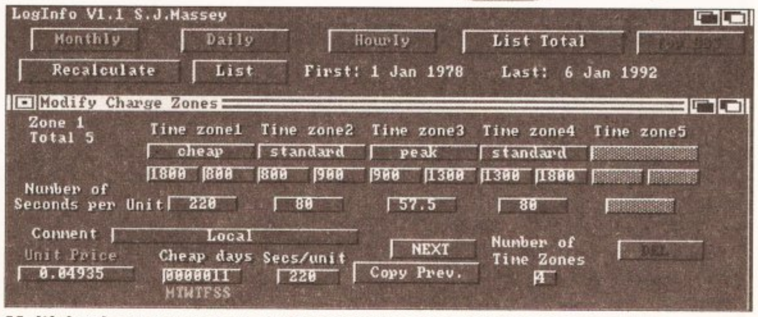
This month Phil Harris enters the fourth dimension in search of a BBS system and examines the new NComm log file analyser



LogInfo also provides a general summary of all the calls in the logfile, and an estimate of the cost so you can warn your wife

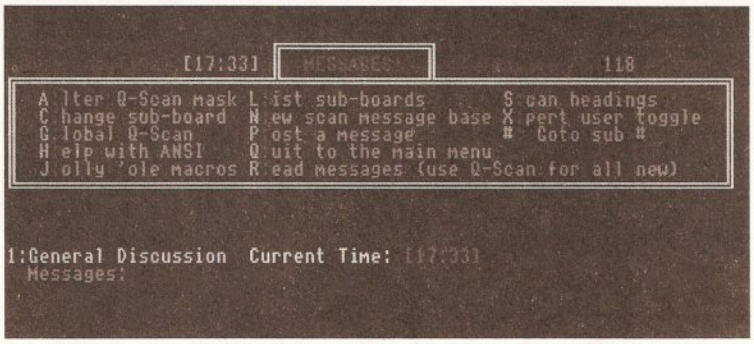
4D-BBS

The 4D-BBS I've been looking at is actually the 4D-BBS DEMO. The difference between the demo version and the full shareware item is minimal.



Multiple charge zones are a piece of cake, once you've mastered the requester from hell!

Firstly a couple of items are missing (the voting booth door for example) and secondly there will be no new features added to the demo. Only the full registered version will be improved on. Bug fixes will appear for the demo though, although so far I haven't found any bugs which need fixing.



One of the many user screens provided by *4D-BBS*. It's not at all unattractive by bulletin board standards, with messages in yucky magenta and green

STARTING OUT

The first thing that struck me about the BBS was the ease with which you could start playing. A script is provided to install all the appropriate parts, and another to run the system. This second script did have to be modified slightly to run on my hard drive system but once that was done the system started first time.

The first thing to do is to take a look round the demo BBS and see what the system is capable of. I would recommend doing this *before* you actually read the instructions. The reason for this unusual advice is that one look at the demo BBS and you'll be hooked. Then, when you see how awkward it is to configure the system you'll be too enthusiastic to give up.

The demo BBS gives you an insight into the power of the system. The main menu contains no less than twenty options. All the usual facilities are there, messages, files, E-Mail and full ANSI support.

Beyond those are a couple of interesting and less common options, a user listing (listing all the users on the system which match a search string), a built in BBS list (a common feature of most boards, but usually as an add on) and something that really took my fancy, "Multi-mail".

MAILING LISTS

Multi-Mail is (as far as I know) unique to 4D, but not for long I'm sure. When you enter a Multi-Mail message you specify up to 10 users and the mail message is sent to all of them. It's an obvious idea, and not necessarily useful for everyone but for a sysop it's a godsend!



Here is a screen in *4D-BBS* which serves both as an advert and a prompt to ensure you get around to registering your copy

Figure 1: 4D-BBS configuration file – the main menu

```
mainmenu.txt
  [33mMAIN MENU: [0m

m:1 % base.menu
d:1 $ file.menu
y:3
u:5 a None
w:5 s 0
1:6
e:7
j:q
f:1 % feed.menu
r:m r 0
s:m s 0
!:m m 0
v:e Sorry, but the voting booth door is not available yet.
g:j 0 0
a:d a
b:d s
```

MACRO FACILITIES

The other feature in 4D that appealed to me is the macro facility. This allows a set of keypresses to be assign to one of three macros, just like in word processors. The power of this feature is that it is the USER that sets up the macros, for her own use.

It's this sort of thought that helps raise certain shareware products above the commercial competition.

Once you've taken a look round the demo board it's time to sort out how to make your own. A quick read through the documentation (which is, thankfully, relatively short) reveals that there is no easy to use, intuitive setup program, it's text file time.

TEXT FILE AGONY

There seems to be a trend in Amiga programs to skimp on the setup for a program, no matter how complex. Soft-Span BBS (see last issue) used text files to configure it, *Transamiga BBS* (mentioned briefly last month) uses a very basic program to modify it's setup, even the classic directory utility, *SID*, still uses a text file. All of these programs really need a mouse driven configuration system. New users do not want to be wading around in the CLI to set up their new software.

Unfortunately 4D is even worse in this respect. Figure 1 shows an example configuration file for the main menu (in this case from the demo BBS).

The first line tells the system which text file it should display when this menu is reached. This name will have .ansi or .ascii appended to it depending on whether the user has ANSI colour turned on or not. It's up to you what goes in this file, it's usually a pretty picture. The second line of the file gives the prompt that is to be used with this menu.

The rest of the file lists the keys available, and the actions assigned to them. The action is given a one character code, with any options required given afterwards.

Figure 2 gives a list of the various options which are available.

The majority of the commands also feature sub commands that modify the behavior. For instance, command D has two subcodes, using the subcode A will prompt the user to enter a new BBS, while subcode S will show the whole list. The text file also allows you to set the access level for a particular option, to prevent new users accessing somehwere they should or to allow sysop only menus.

GLOBAL OPTIONS

A couple of other menus give you the facility to have a standard set of commands available from everywhere and also a special menu that people you have banned from the system are placed in when they log on. Both of these are optional.

Both message and file bases are set up almost identically. A text file is created listing the maximum number of sub areas, the area names and in the case of message bases, the maximum number of messages in that area. Messages are stored in separate directories in a one file per message format. This causes a pretty high overhead which could do with changing.

CONCLUSION

4D-BBS is an excellent system, even the demo version (which incidentally, can be used for as long as you wish). The full version promises to be even better.

My only major criticism of it is the lack of intuitive set up program, something a lot of Amiga programs could do with. A reference sheet is provided though so once you get the hang of setting up the text files you'll be able to breeze through even the most complex system, and you do only have to do it once.

And, it does only run in NTSC a bit of a let down but not too drastic. Overall *4D-BBS* is an excellent BBS for $29.95 and it's even better value if you stick with just the "demo".

UNTIL NEXT TIME

Thanks go to Chiba City BBS (0501 44262) this month, for supplying the excellent *4D BBS*. Give Chiba a call, it's well worth a look, if only because it runs on an Amiga (something that is becoming rarer by the day).

Next month I'll be comparing some of the most popular Amiga boards, seeing what makes them special and trying to discover why they are a success. Till then, happy comms.

Philip Harris can be contacted on CIX (081 390 1255) as piharris or on the End Zone BBS (0524 752245) as PHILIP HARRIS.

Anatomy of CHAOS

So you've heard of chaos theory and dabbled with fractals. But what exactly is chaos, what use is it, and just what's so special about fractals anyway? Conrad Bessant provides the answers in the first part of our 'hands-on' chaos tutorial

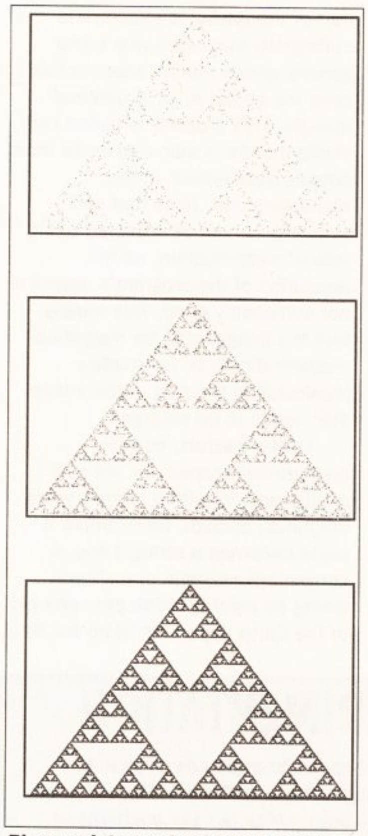
The new science of chaos, with its fascinating images and strange concepts, seems to have captured people's imagination like no other science. After getting a taste of chaos through the media, many people are eager to know more, but the terminology and ideas involved can seem difficult to comprehend and the definitions found in textbooks are generally dry and highly mathematical, deterring even the most inquisitive reader. In this series we dispense with the complicated maths and jargon, and explore chaos in a more practical way, using the Amiga.

ORIGINS OF CHAOS

During World War Two, military strategists and politicians realised that the accuracy of the weather forecasts on which they relied could be greatly improved. Following the war a lot of money and manpower was invested in meteorology, the science of weather and climate, in an effort to improve these forecasts. It was hoped that with the new technology, and with large research funds, accurate long-term weather forecasting would be possible. As we all know, this was never realised. At the time people were surprised at the scientists' apparent failure, and could not understand why the scientists with their expensive equipment were no better at forecasting than the local soothsayer.

Realising that they were getting nowhere at great expense, scientists working on meteorology began research, using simple computer-based mathematical models, to determine why weather prediction was so difficult. Simultaneously, other researchers were investigating other unpredictable elements of nature, such as population dynamics. Connections began to appear between the different kinds of unpredictability, common characteristics could be seen to be exhibited in erratic processes taking place in many subject areas, from economics to chemistry. Processes displaying these characteristics became known as chaotic processes due to their pseudo-random nature. The study of their similarities became the new science of chaos.

The catalyst for chaos research has undoubtedly been the computer, the multitude of calculations that must be performed in even the simplest of chaotic processes make manual calculation practically impossible. In the beginning it was only well-funded universities and military establishments that could afford the equipment to carry out such experiments, but since the home computer boom of the eighties cheap computers like the Amiga have brought chaos within the grasp of many other people. The Amiga's speed and excellent graphics capabilities make it ideal for chaos work. In many respects, the Amiga is better than the computer which, in 1980, Mandelbrot used to produced the famous Mandelbrot set.



Place points randomly on the screen and, after a few seconds, the Sierpiński gasket appears

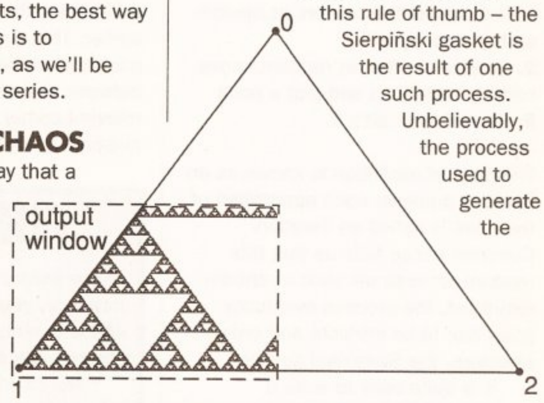
WHAT ARE FRACTALS?

Closely associated with chaos theory are fractals, the elaborate patterns which can now be found on T-shirts, record covers and, of course, in computer magazines. Fractals are so intricate that they can't be treated like normal geometrical shapes such as circles and polygons, and have surprisingly little ordered structure, despite the fact that they originate from simple rules. It is difficult to accurately define fractals without reference to some complicated mathematical concepts, the best way to understand fractals is to experiment with them, as we'll be doing throughout this series.

ORDER FROM CHAOS

Usually it is safe to say that a random process produces random results, and an ordered process produces ordered results. For example, randomly falling rain produces an even spread of raindrops with no structured pattern, but a set of explicit commands or equations (a deterministic process) gives a predictable, ordered, result.

There are, however, some processes which do not abide by this rule of thumb – the Sierpiński gasket is the result of one such process. Unbelievably, the process used to generate the



The easiest way to zoom into a section of the gasket is to enlarge it so that only the relevant section falls within the output window

CARTESIAN CO-ORDINATES

If you have done any graphics programming before you will have come across a co-ordinate system, although you may not have noticed its formalities at the time. When you have a plane surface, like the Amiga's screen, you must have some system with which you can describe the position of any point on it. This is called a co-ordinate system.

The easiest way to describe the position of a point is by using a Cartesian co-ordinate system. A variation of this is used in Amiga BASIC's graphics functions. For example, when plotting a point using the PSET command the position of the point must be specified by stating its co-ordinates, ie how far across it is (the x position) and how far down it is (the y position). Such co-ordinates are usually written in the form (x position, y position), so a point 200 pixels across and 100 pixels down is denoted by the position (200,100). This notation is useful when describing fractal generation algorithms and will be used frequently during this series.

LISTING 1 • LISTING 1 • LISTING 1

```
REM Dimension arrays to hold the positions of the corners
DIM x(2)
DIM y(2)

REM Set positions of the three corners
x(0)=320
y(0)=10
x(1)=50
y(1)=190
x(2)=590
y(2)=190

REM Pick a corner at random
corner=INT(RND*3)
px=x(corner)
py=y(corner)

REM Plot points until a mouse button is pressed
WHILE MOUSE(0)=0
corner=INT(RND*3)          'Pick corner at random
px=px+(x(corner)-px)/2     'Move halfway towards corner...
py=py+(y(corner)-py)/2     'held in corner variable
PSET(px,py)      'Plot the point
WEND
```

incredibly complicated gasket is based on randomness.

The starting point for the gasket is a two dimensional plane, on which an isometric triangle is outlined by its three corners – we'll number these 0, 1 and 2. The Sierpiñski gasket can be created on this plane by applying the following rules:

1. Pick one of the corners at random and go directly to it
2. Choose another at random, move halfway towards it and plot a point
3. Repeat from step 2

This type of repetition is known as an iterative process; each application of the rules is called an iteration. Common sense tells us that this random process will yield a random result but, the process eventually gives rise to an intricate and ordered structure, the Sierpiñski gasket.

It is quite easy to write a program to perform this iterative process and thereby produce the Sierpiñski gasket. An Amiga BASIC version of such a program is given in Listing 1. We'll be using Amiga BASIC throughout this series, not because it's a great language for chaos programming, but because most Amiga owners have got a copy of it. If you haven't got a copy, or would prefer using another language, don't worry, all the listings will be easy to convert.

Basically the program can be broken down into three sections. The first section dimensions two arrays to store the x and y positions of each of the three corners of the triangle, and places suitable values in them. The next section corresponds to stage one of the above process – it initialises the drawing position by randomly setting it to be at one of the three corners. The drawing position is held in the px and py variable pair, and determines where the next point is to be plotted. The final section is the WHILE...WEND loop which actually plots the points – this loop represents stages two and three of the process defined earlier.

The only tricky area in this program is the part which moves the drawing position halfway towards a corner. This is done by finding the mid-point of the imaginary line between the current position and the relevant corner, and moving to it. The mid-point is found using a branch of mathematics known as 'co-ordinate geometry'. This states that if there are two points with co-ordinates (x,y) and (x1,y1) respectively, the mid point of the line between them is at (x+(x1-x)/2,y+(y1-y)/2).

IS IT A FRACTAL?

The Sierpiñski gasket exhibits two features which distinguish it as a fractal. The first is the fact that a complex and structured pattern is created by just a few simple rules. The Mandelbrot set (which will be covered later in the series) is probably the most famous example of this, as one equation gives rise to an infinitely rich structure.

The second point is that, if any part of the gasket's structure is sufficiently magnified, the same general shape can be seen, in this case the shape is an equilateral triangle. This property is called self-similarity, which also makes its most notable appearance in the Mandelbrot set. Note that self similarity cannot be explored using optical magnification, as the resolution of the program's output is not sufficiently good. This means that the image must be magnified mathematically by completely recalculating the part of the image that needs to be enlarged.

Unlike fractals, normal geometrical shapes are not self-similar and lose their identity when magnified enough, for example a circle becomes a straight line. A convenient example of a shape losing its identity is the phenomenon of the Earth appearing to be flat to a person standing on it, because they can only see a tiny fraction of its surface.

ZOOMING IN

Self-similarity can be seen in the Sierpiñski triangle by altering the program in Listing 1. Just enlarge the triangle so that only a small part of it lies within the screen area. The program will still move the drawing position to each point, but will only plot points which lie in the output window. The triangle is enlarged by altering the positions of the three corners, which involves changing the section of the program which sets the corner positions. For example, a magnification of three can be produced by altering the lines, so:

```
x(0)=1105
y(0)=-530
x(1)=25
y(1)=190
x(2)=2185
y(2)=190
```

When enlarging fractals it is imperative that the ratio of width to height (the aspect ratio) is kept constant. If this ratio is not maintained the fractal will become distorted, making self-similarity hard to spot. The Sierpiñski gasket used in this article is 50% wider than it is tall. I have ensured that the enlarged gasket also has this property, thereby preserving the aspect ratio.

Something to note while experimenting with magnifications of the Sierpiñski gasket is its lack of substance. This may sound bizarre but in fact all of the areas which appear to be comprised of solid black lines are actually full of triangular shaped holes. This is also true for consecutive magnifications, suggesting that the lines between the triangles are infinitely thin (hence non-existent), and implies the Sierpiñski gasket to be nothing more than a group of holes!

Although turn of the century mathematicians were intrigued by the strange objects that they had discovered, they found it hard to continue their investigations due to the vast number of calculations required. Because of this, objects such as the Sierpiñski triangle were regarded as nothing more than mathematical oddities for many years, until the advent of chaos, when natural processes were shown to exhibit similar behaviour. Next month we'll be looking at chaos in nature, with a population simulation to show that order can give rise to chaos.

This series of articles is based on Conrad Bessant's forthcoming book, Computers and Chaos: Amiga Edition, for details ☎ Sigma Press on 0625-531035.

FURTHER EXPERIMENTATION

In the examples given here only one shape of triangle has been used, however, you should find that any triangle shape will work. Changing the shape is simply a matter of editing the lines which set the positions of the triangle's corners.

You could try using a shape with more than three corners, ie a shape other than a triangle. Only a few simple alterations are required to make the program produce a different shape, for example, to produce a square you must do the following:

- Alter the lines which dimension the position arrays to cater for four corners (0 to 3) instead of only three

- Edit the lines which set the positions of the corners so that the corners describe the outline of a square (two new lines will be needed to describe the fourth corner)

- Replace the line which randomly picks one corner out of three so that it picks one out of four instead

Why move only halfway toward a corner each time? Why not try moving two fifths of the way toward the corners? Changing this is useful if you are using shapes other than triangles. The results of these changes may not all be interesting, but without experimentation you never know.

The ultimate extension of the Sierpiñski gasket principle is to create a program to produce the three dimensional Menger sponge. The Menger sponge is a cube made of cubic holes, just as the Sierpiñski gasket is a triangle full of triangular holes.

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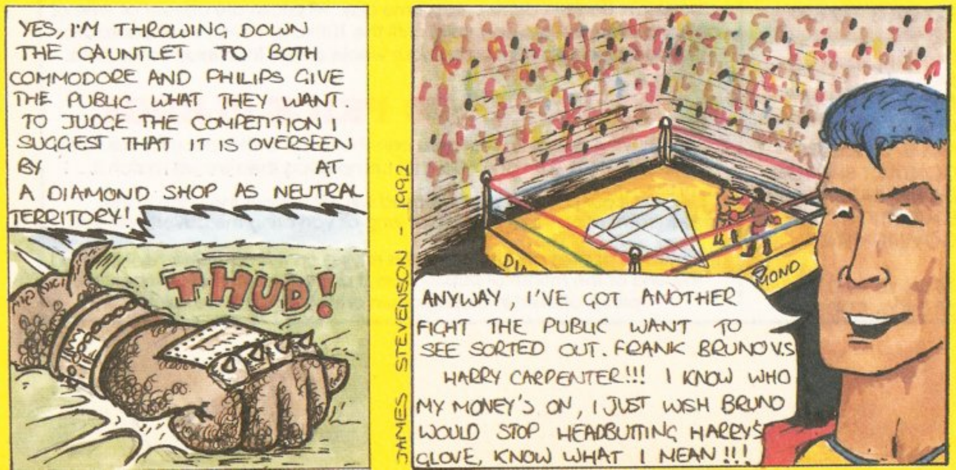
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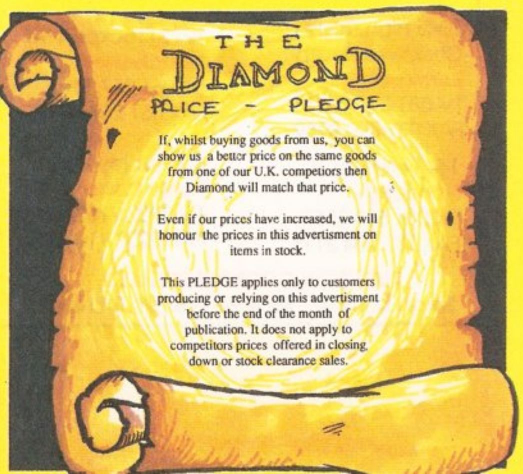
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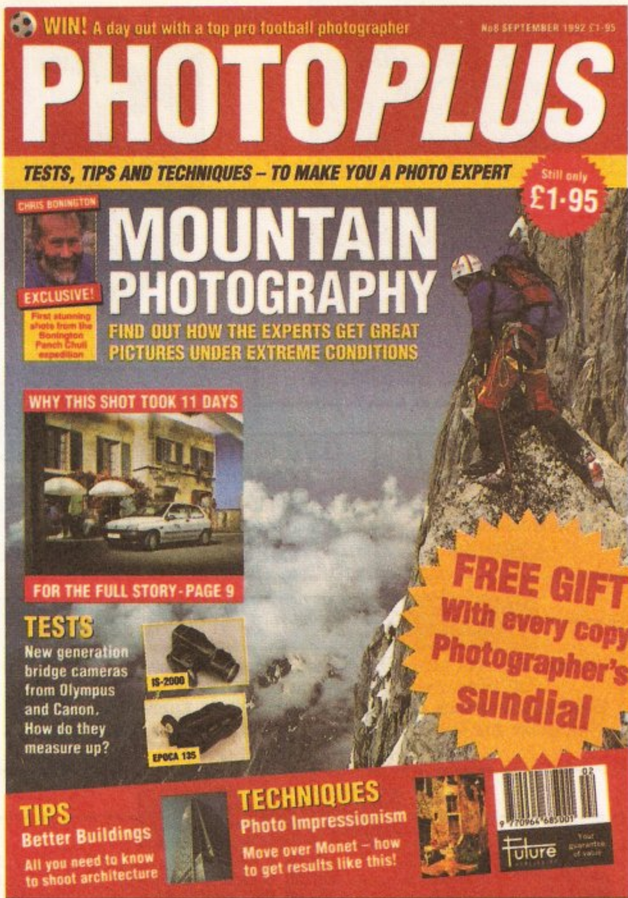
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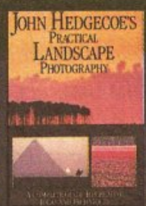
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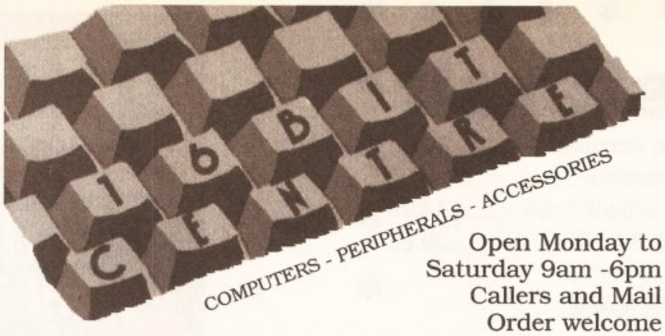
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Access

LAZING by the gene pool

Ever fancied creating an intelligent life form with an Amiga – it's easier than you think. Sit back and relax as Philip Gladwin shows you how it's done...

First... let's digress. Let's talk about cockroaches. When I was a student, I minded very much about these little fellows. I minded the fact that although they had so little going for them on the charisma front they seemed to do so well out of life. How is it, I wondered that when mankind has managed to get rid of so many mild-mannered and inoffensive species in the world without really trying, these revolting things were not on the retreat, not on the threatened list, but actually prospering. In our boiler cupboard at least.

Well, the short answer is that they've worked at it. Faced with the hatred, fear and loathing of every right-minded creature, they evolved themselves into a position of, if not strength, then resistance. They

> **"One school of thought... follows the principles of genetics to evolve solutions"**

seemed to settle down early on, adjust to the fact that the world was a cockroach hating jungle, and get on with developing little skills, like surviving six months in a vacuum cleaner, a genuine hunger for dry flakes of paint and the ability to walk away from an all-out nuclear attack.

The heart-warming success-in adversity story of the cockroach just goes to illustrate that in this life the prize generally goes to the strongest. If you're weak, then goodnight. (Hard stuff, I know, but, no-one said it would be easy).

I'm here over the next few months to show you how this 'red in teeth and claw' outlook in life can help you, there, sitting at your Amiga. I'm going to be giving you the low-down on writing a system that takes a tip from the repulsive cockroach and evolves; starting off as a confusing maze of instructions and ends up as taut, lean code that simulates a cockroach in solving the problem of finding food.

BIOLOGICAL NECESSITIES

This month, I'm going to go over the biological stuff you need to know and give some of the more relevant theory a dust-down; next month, we'll get down to specifics. As the series runs, I'll describe the particular set-up for creating the cockroach, setting it running, and watching it bang its head on obstacles. After that crazily exciting experience, I'll talk you through the AMOS code that it needs to make it evolve what you could call a slightly more intelligent attitude to its environment.

Let's face it; nature is better than us at most things. In particular, it has a great ability to produce organisms which can survive despite vast changes to their environment. In the short term an organism gets by with instinct, intelligence and luck. In the long term the survival of individual species rests with a process called natural selection.

NATURAL SELECTION

Natural selection works on a "throw enough muck at the wall..." principle. The stuff that sticks to the wall, or survives, is a better solution than the stuff that doesn't; if you filter out the better stuff and use it as the basis for the next handful to be thrown, you'll soon approach an optimal solution to your problem of survival. And this, given that nature can't be said to have an intellectual understanding of problems, is a powerful problem-solving technique. (Of course, nature has a cast of billions, a huge budget, and millions of years to sweep mistakes under the carpet, but we'll gloss over that).

GENE GENIUS

So what can we learn from this? We too have many problems of which we can't be said to have a full understanding. Take modelling the economy or allocating resources on a computer network. What we need is a way of using the computer to work out what the problem is, and getting it to work out its own solutions. One school of thought favours writing software which follows the principles of genetics to evolve solutions. This month I'll be explaining the concepts behind this technique, and over the next few months I'll be giving you code so that you can build your own genetically evolving problem solver.

IT'S EASY – JUST BREED AND DIVIDE AND YOU CAN CONQUER THE WORLD!

There's been research aimed at applying the 'survival of the fittest' theory to computing since the 1950s, but it's generally been low profile, with the majority of the discussion going on in academic papers and assorted PhD theses. Recently the situation has changed a bit; genetic algorithms are more widely known, and they've started to make it into the popular science press with some regularity.

A man called John Holland is probably most responsible for this growth in interest. In 1975, he published the inspirational *Adaptation in Natural And Artificial Systems*. This laid down methods of representation still used widely today. His success was to represent chromosomes as bit-strings (strings of 0s and 1s), and to invent a genetic algorithm to manage operations on these bit-strings to alter and improve conditions.

To understand how it all works, take these bit-strings as representing rules, conditions and actions. Imagine two 8-bit bit-strings, or rules: 10110001 and 1???1?10. In this case assume that the first six bits represent the input section of the string, (the conditions for this rule) and the last two bits the output pattern (the actions).

TERMS AND CONDITIONS

The first rule is straightforward – if it encounters another string that matches its input pattern of 101100 then it requests that the action 01 is taken. The second rule introduces the idea of wildcards. All a string has to do to match the condition for rule 2 is to have a 1 in its first position and a 1 in its fifth.

The question marks indicate that it doesn't matter what fills the other bit positions.

Rule 2, when its conditions are fulfilled, requests the action 10.

Now, let's go further. Make each place in the bit-string stand for a characteristic.

Define each place in the string as standing for a particular feature, creating a concept template. Measure other strings by this template. So if your rule is looking for a particular characteristic it would be looking out for a '1' in that slot in the strings it was given. If it wanted the characteristic to be absent it would look for a '0'.

A string to recognise a human baby (see the diagram on page 110) would have an input section with feature places like "cries", "small", and "wriggles".

The output section of the string would be made up of similar features designed to trigger specific actions in the rest of the system.

small	cries	wriggles	made of jelly	feed it	eat it
1	1	?	?	0	0
1	0	?	?	0	0
1	0	0	1	0	1

1 If it is small and crying: *feed it*
2 If it is small and not crying: *do nothing*
3 If it is small, not crying, not wriggling, and made out of jelly: *eat it*

A '?' indicates that the rule isn't bothered about that feature in that context. More than one rule can match the same input section; use the rule that matches it more completely

THE THREE RULE CLASSIFIER SYSTEM IMITATING A PRE-TEENAGE BABYSITTER

MATE OR MUTATE?

Let's go on looking at the real world for a bit. In any particular species, 'survival of the fittest' weeds out all the failures, but that's only a part of the story. Without regular shake-ups it would be easy for a species to become inflexible – that is, well adapted for living in one particular environment, but rigid and vulnerable as soon as things changed.

The mechanics of sexual reproduction are what ensures this doesn't happen. Sex continually stirs the gene pool to provide a supply of new physical characteristics. This shake-up occurs at conception, when the sperm and the ova swap genetic material. Chromosomes from each side pair off according to type, and cross over part of the way along their length. The new organism is provided with a varied bag of genetic material, giving rise to fresh possibilities for combinations of physical characteristics, greatly speeding up evolution. Of course, random mutations would eventually throw up changes in organisms reproducing without this cross-fertilisation, but the blending that sex provides is a much stronger way of doing it.

RANDOM ALTERATION

All well and probably true, but how do we apply this to computerised problem solving? You know how picky computers can be; imagine the protests you'd get from your compiler if you "mated" a few C programs by hacking out all your favourite chunks and slinging them all together into a single super-program. Or if you "mutated" an AMOS program by randomly altering every 100th line. Dodgy as it sounds, there's got to be some mileage in the idea – look what it's done for the world over the last few billion years.

AMAZINGLY INTELLIGENT

Let's take yet a swipe at simulating Intelligent behaviour with an Amiga. And to make it even harder, this time, intelligence must arrive out of nowhere, erupting out of a random sea of bit-strings.

To start off, I'll offer you a target definition of the type of intelligence I'm going to try and simulate.

This definition comes courtesy of a physicist called van Heerden. He said that, "Intelligent behaviour is to be repeatedly successful in satisfying one's psychological needs in diverse, observably different, situations on the basis of past experience.")

This may be debatable, but go along with it for a bit. Imagine a very primitive organism, existing only to find food. Imagine an environment in which to put this organism. (Like, say, a maze, with the odd bit of food lying around).

EVOLUTION – IT'S THE REAL THING

In the real world the problem solved by evolution for each species is that of finding ways of changing to survive in and exploit a complicated and changing environment. Each species acquires experience of how to live in the world and accumulates this experience in a bank maintained in the chromosomes of each member of the race. When reproduction occurs, this chromosomal make-up is altered, via operations such as random mutation, inversion of chromosomal material and crossover. The effect of random mutation is to maintain a low background level of change with the occasional injection of beneficial alterations. Inversion changes the locations of genes on a chromosome, upping the likelihood of them being transferred together during crossover. Crossover swaps corresponding genetic material from two parent chromosomes. This has the effect of allowing useful genes from different parents to be combined.

Genetic algorithms get their strength from the heavy use of the crossover process, which acts to speed up the mixing process. If crossover didn't occur, then for a given individual to receive two good mutations, one of the mutations must occur to a parent, and then the second mutation must occur to one of that parent's offspring. Therefore it would be easy for a species reproducing without crossover to have a population containing members with one or other of the two mutations, while no member had both. With crossover, beneficial mutations on two parents can be combined immediately when they reproduce; if the most successful individuals use crossover and reproduce more often than less successful individuals, then it's much more likely that this will happen.

In order to simulate this on a computer we'll need a data structure to take the place of the organism, and another data structure for the maze.

PAST RECORDS

It's fairly easy to simulate "satisfying one's psychological needs" by giving the data structure a reward. Similarly, you can give the data structure an awareness of "observably different situations" by giving it a system of input channels responsive to changes in its surroundings. Finally, "past experience" becomes some sort of record of previous interactions with the maze and their results.

It's not too hard to imagine an expert system that could do this, given enough thought on the part of the programmer. But the single biggest problem with expert systems is that they need someone to code every single one of the rules that they will use. In the case of complex problems this involves many cycles of design and test, and the hardest problems may just be too complicated to manage.

INTO THE MAZE

So, let's make our situation more interesting by programming the bare minimum into the situation. Start off with the organism and the maze. Give the organism restrictions on its movements (eg it can't walk through walls) and rewards when it finds food.

By creating this environment, and a data structure with a means to perceive that environment, and a means of associating changes in its perceptions with movements it has made, we have created a basic feedback circuit – it perceives, moves, gets new perceptions; sometimes it gets rewards. The trick is to get the data structure to link it together and begin to "learn" which movements produce which sensory signals, and in particular, which movements result in rewards.

This, then, is the problem: by starting the program off by creating a random selection of rules which have little or no relevance, the task becomes a matter of: finding and emphasising the rules that work well; getting rid of those which don't; and making sure that the rules which are kept are as useful as possible.

COMING SOON – LOST IN THE FOREST

Next month I'll be going into more detail regarding more problems, the programming practices you need to get into, and an explanation of how the code I'm giving you works to simulate a tiny string creature evolving intelligence as it wanders around a leafy wood. (Honest). AS

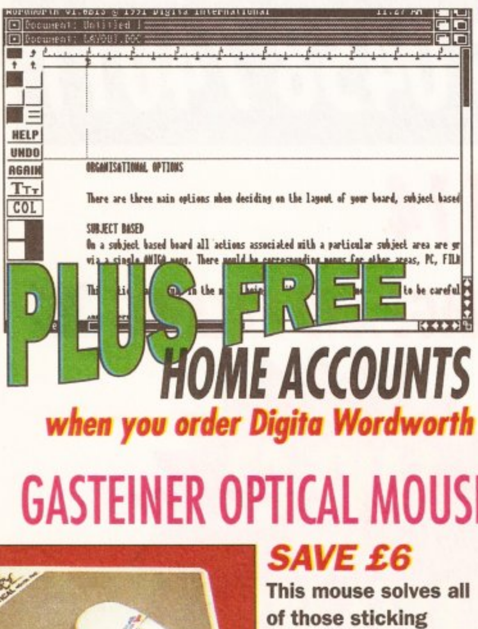
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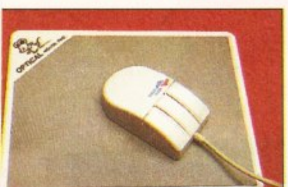
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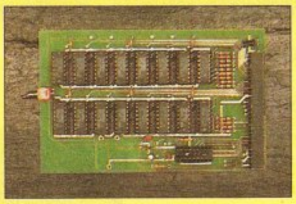
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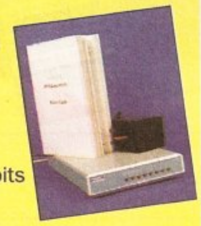


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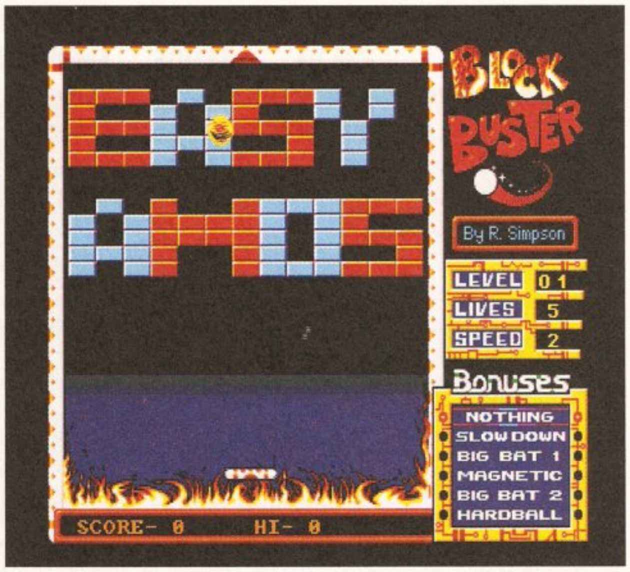
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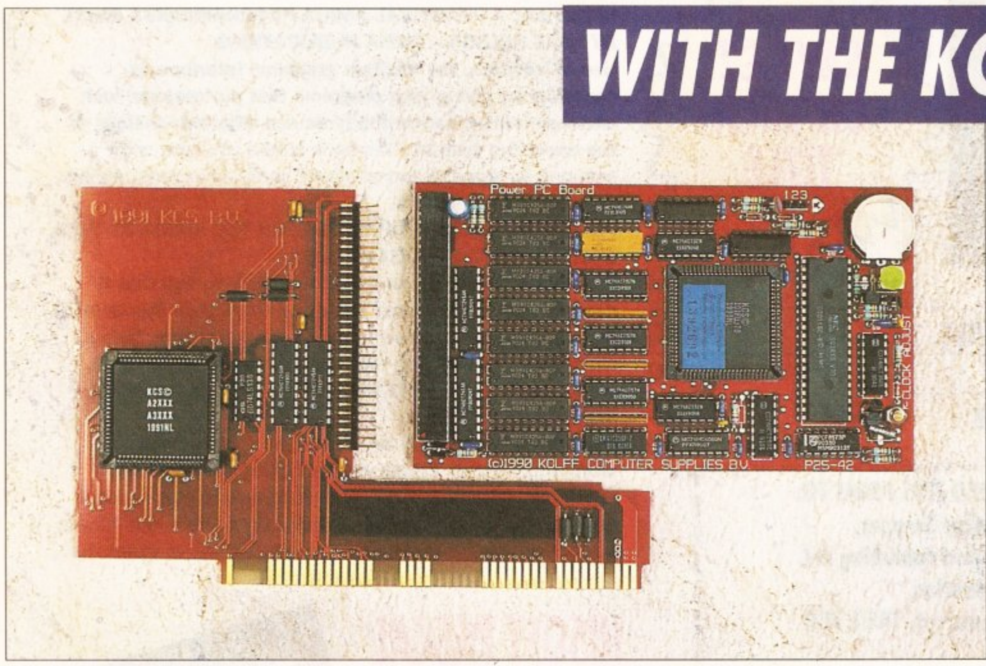
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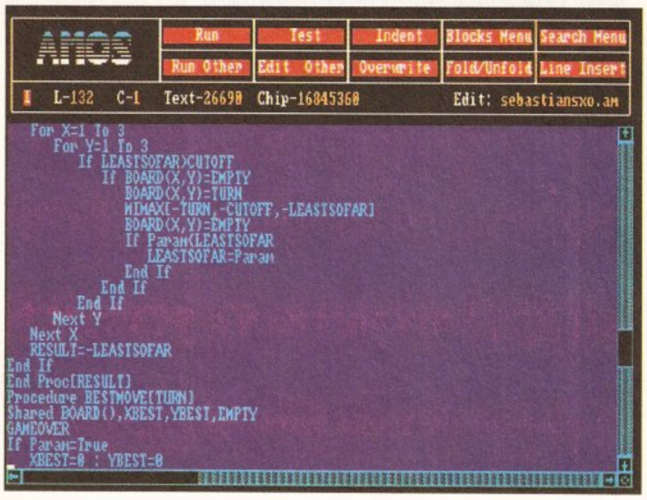
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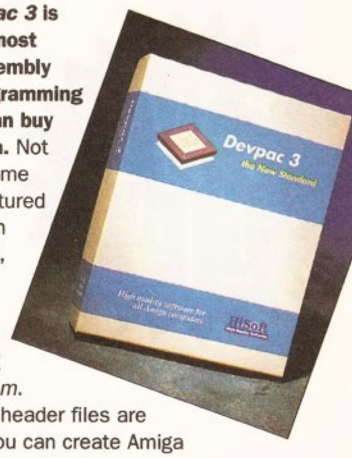
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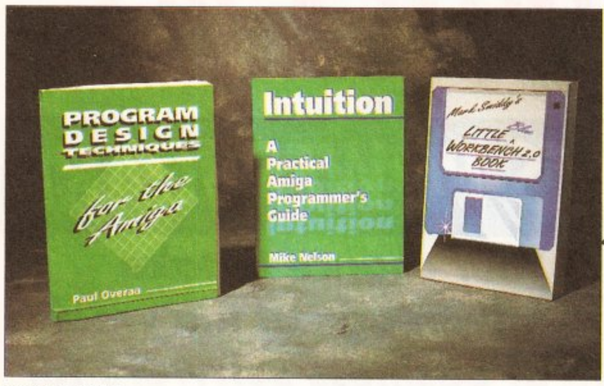


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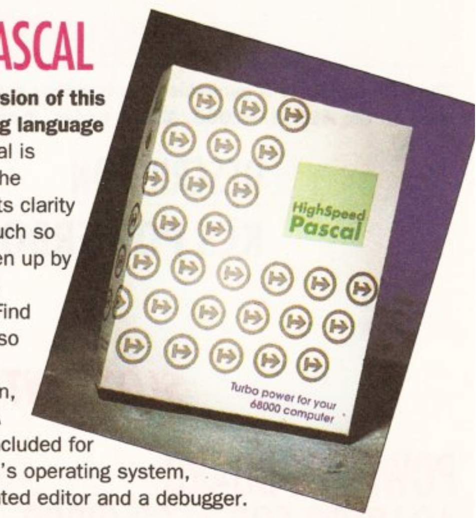
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The max FACTOR

***Maxiplan 4* is the latest release from The Disc Company. It's a spreadsheet aimed squarely at the professional market – but is it good enough?**

***Maxiplan 4* is the latest version of one of the most powerful Amiga spreadsheets available – and one which Commodore saw fit to include in one of its special packs. It sounds very impressive – basic features include multiple-spreadsheet views, outlining and basic project planning. An extensive macro language plus an entirely text-based chart type allow for complex presentations to be built up. Is *Maxiplan* as good as all that?**

Installing the program to hard disk is a drag since the authors have not supplied a suitable installation script. According to the documentation, you simply copy the *Maxiplan* drawer from the distribution disk on to a hard disk partition. Next you have to add a line to the Startup-sequence to enable *Maxiplan* to locate its required files. Modifying a startup-script is not something for the beginner or business user and is simple to perform from an AmigaDOS script. Also, under Workbench 2 the User-startup script is designed for third-party software – the main file should be left well alone. Just to make things worse, the version supplied for review required an extra library present in the LIBS: directory.

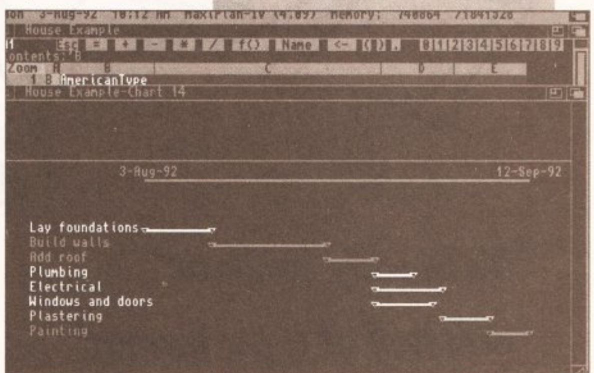
The instant the program appears on a modern Amiga, it begins to show its heritage. The design looked pretty good back in 1989, but as time has moved on, *Maxiplan* has stolidly stayed put – and in computer terms that puts it back in the bronze age. These days, 3D bas-relief is in – not just because it looks attractive, but because it's functional. Where most modern WIMPs are picked out in cool stone-grey, *Maxiplan* instantly insults the eyes with a brash, puce and azure colour scheme.

COLOUR LIMITATIONS

On the subject of colour, it is interesting to note that the current version does not display 16 colours on medium resolution – so unless you have a flicker fixer, eight colours is the realistic limit. In addition, setting the Tooltypes (startup configuration strings) from Workbench is not described in adequate detail. The tooltypes array is case sensitive ("ABC" is not the same as "abc") and although the tooltypes are illustrated in uppercase, the stipulation is not made.

It would have been simpler if The Disc Company had set some example tooltypes for the inexperienced user to edit. Although the manual claims *Maxiplan* will support future variations of colour and screen resolution, it seems to have forgotten Productivity, SuperHiRes and A2024 modes all supported by recent hardware and Workbench 2.

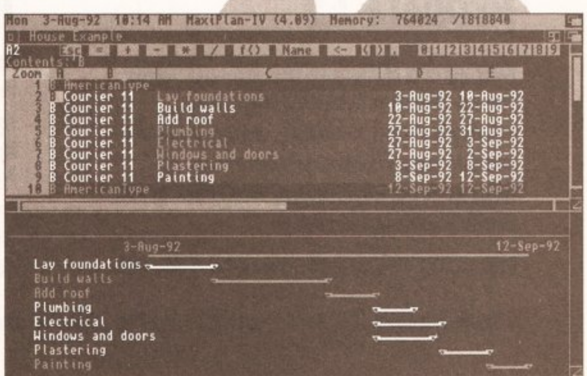
Cancel the default opening file requester (a nice but often annoying feature) and a new window opens. The menus (from left to right) begin with Print followed by "D" followed eventually by File. This might seem a minor objection, but the thinking behind Apple's idea of keeping *all* software functionally the same is clearly illustrated here. Most Amiga applications follow similar guidelines and place the File menu (which should include Print) as the leftmost option. Worse still, the paste key is A+P – not the standard A+V – which incidentally freezes rows. Experienced users will find this system an irritation; beginners, confusing.



An example of a basic Gantt chart created with *Maxiplan 4*. Each project is displayed as a single line

An enhanced file requester is available by copying *Maxiplan*'s extra requester (req.library) into the Workbench's LIBS: assignment. Although better than the default one, this has two problems: first the name may not be unique – and should have been prefixed with something like "MP" to make it so. (*Wordworth* users will note, its requester library starts with "WW", an example of how it should be done.) Second,

continued on page 117



A Gantt chart with the corresponding data on view in the upper window for comparison

DIAGRAM TO ILLUSTRATE THE CONCEPT OF OUTLINING

	A	B	C	D	E	
1		January	February	March	April	
2	Sales	20,000.00	21,000.00	22,000.00	21,000.00	22
3	Interest	600.00	600.00	600.00	600.00	
4						
5	Total in	20,600.00	21,600.00	22,600.00	21,600.00	22
6						
7	Stock	35,000.00	0.00	0.00	35,000.00	
8	Phone	0.00	0.00	0.00	8.00	
9	Wages	2,000.00	2,000.00	2,000.00	2,000.00	2
10	Rent	4,000.00	4,000.00	4,000.00	4,000.00	4
11	Htg, Ltg	300.00	300.00	300.00	300.00	
12	Others	900.00	900.00	900.00	900.00	
13						
14	Total out	42,200.00	7,200.00	7,200.00	43,000.00	7
15						
16	Profit	*-21,600.00*	14,400.00	15,400.00	-21,400.00	15
17	Balance now	10,000.00	*-11,600.00*	2,800.00	18,200.00	-3
18	Balance Avail	*-11,600.00*	2,800.00	18,200.00	-3,200.00	12

Outlining at its lowest level shows the whole of the sheet with all the details

	A	B	C	D	E	
1		January	February	March	April	
5	Total in	20,600.00	21,600.00	22,600.00	21,600.00	22
14	Total Out	42,200.00	7,200.00	7,200.00	43,000.00	7
15						
16	Profit	*-21,600.00*	14,400.00	15,400.00	*-21,400.00*	15
17	Balance now	10,000.00	*-11,600.00*	2,800.00	18,200.00	*-3*
18	Balance avail	*-11,600.00*	2,800.00	18,200.00	*-3,200.00*	12

Outline level 2 (in this example) removes most of the private detail and provides detailed summary data

	A	B	C	D	E	
1		January	February	March	April	
5	Total in	20,600.00	21,600.00	22,600.00	21,600.00	22
14	Total out	42,200.00	7,200.00	7,200.00	43,000.00	7
15						
18	Balance avail	*-11,600.00*	2,800.00	18,200.00	-3,200.00	12

Outline level 1 shows only the summary results

continued from page 115

what about Workbench 2's ASL library? If this program is really Workbench 2 compatible, why isn't it aware of the standard file requesters?

REDEEMING FEATURES

I have detailed these major problems with *Maxiplan* early to allow the casual reader to reflect if this program may be worth considering. For most users, there are far more friendly systems around – but *Maxiplan* has many redeeming qualities that should be considered by the hardened professional user.

First time users will find *Maxiplan*'s help system a real boon. Help is available for all menus – listed within the menu itself. The help system is quite extensive and often better than the supplied documentation. Likewise, the (almost obligatory) Paste Function feature includes a syntax helper within the requester.

Users creating sheets for others to use will find *Maxiplan* offers an interesting option to assign names to cells and ranges. This can make formulae in particular a lot simpler to read and debug.

As an example:

=(INCOME-EXPENDITURE)

is simpler to read and more meaningful than:

=(A12-A35)

similarly,

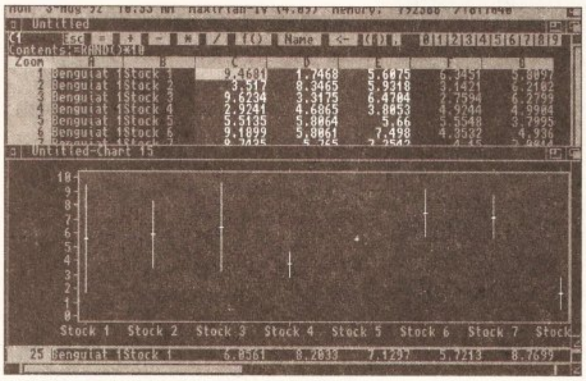
=SUM(PROFITS)

is nicer than:

=SUM(A2:A11)

Like *Professional Calc, Maxiplan* features "outlining" – it was the first Amiga sheet to offer it too. As I noted in the *Pro Calc* review, outlining is difficult to describe – but in essence the idea is to define "outlines" which display certain parts of a 'sheet. Outlines can be nested too. Take a look at the illustration on the previous page for an example of outlining at work.

Programmers will find *Maxiplan* has an interesting facility called Desk Accessories. This concept, which is "borrowed" from the Macintosh, allows third party tools to operate with the program. When *Maxiplan* is opened it searches for any accessories stored in a special drawer within the *Maxiplan* drawer



Wall Street, here I come – *Maxiplan 4*'s hi-lo chart with a simulated stock analysis as data

and adds them to its "D" (desk accessory) menu. Tools (programs) which will open to the front most Amiga screen can be used in this way, an example calculator is supplied although this is of limited use.

Typically accessories should support the Amiga's clipboard device so data can easily be exchanged between the accessory and the spreadsheet. Strangely enough, although *Maxiplan* does support the Amiga clipboard (and too few programs do in my view) it also has its own version. In effect this means there are two broadly similar Copy and Paste operations: normal – *Maxiplan*'s own clipboard) and external – the Amiga device. I would hope this confusing feature is rectified in a future release.

GRAPHS AND CHARTS

Maxiplan's charting functions have always been one of its strongest points and the latest release is no exception. Although trickier to use than say, *Professional Calc* in this respect, *Maxiplan* has a better choice and more useful options. Some – such as patterned background dithering (vignettes) – are more impressive on a features list than they are in practical terms. Completed charts can be viewed, printed or saved as IFF files.

The charting feature works much like *Advantage* in that you select a range with the mouse and choose a chart type. Data and labels are parsed automatically. Unusually, once the chart has been drawn it is possible to override the default settings. For instance, a typical range might be from A1 to F25. Either the row or column data can be re-written to include more or less of the chart. In this case we could select rows 1 to 12, rows 15 to 22 and row 25. Although simpler than conventional systems where each data range must be determined individually, this seems an odd compromise; even so it's rather nice to have the option.

The requester dealing with this also holds the chart Max and Min settings for each axis, chart and axis titles, plus the labelling options. This does group a lot of things together and looks cluttered, although that has a lot to do with the requester's poor design.

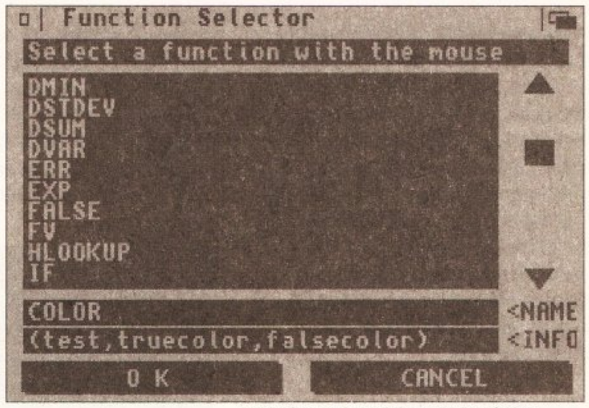
Oddly enough, setting the font and size of the chart text is done within the 'sheet – not as part of the graphics options.

CHART TYPES

Unlike most conventional systems there is more to most of the *Maxiplan* charts than meets they eye – and with a bit of interactive trickery, *Maxiplan* can throw some interesting loops.

As is the case with all other Amiga spreadsheets, *Maxiplan* has no facility to draw to different charts or two different Y axes on the same display. At least it does offer up to 50 charts per 'sheet and a Log scale on some types – which is more than can be said for any of its competition. The following graph types are offered:

• **Pie charts:** are the most basic of them all – since they only display the result of one data set. *Maxiplan* has two variations: standard and 3D. Unlike *Professional Calc* it cannot



Help is on hand for each of the functions within *Maxiplan 4*. Information at the touch of a button

display multiple pies. Any segments on flat pie can be "exploded" or its value displayed with little more than a mouse click; the explode distance is fixed however. 3D pies do not support segment view or explosion, but they can be rotated to enhance the viewing angle.

• **Line charts:** display data in a join-

MAXIPLAN WHO?

Maxiplan 4 has gone through a succession of name changes and distributors, and bears more than a passing resemblance to Best UK's, *Plan/IT 3.0.* The truth is, in spite of the name, the two are more or less the same thing and version 4 adds too few extras to warrant such a major version number. More likely this was a marketing decision as the program reverted to its previous identity, last known as *Maxiplan 2*, as Best UK no longer exists.

JARGON BUSTING • JARGON BUSTING

Function – A spreadsheet facility to perform a special calculation – just like the functions on a calculator. Most spreadsheets have far more functions than even the most powerful calculators. These will range from financial, to mathematical and even scientific. You can use these internal functions to build new ones using macros.

Log scale – Data points on a log scale increase according to a logarithmic rule. This means very large changes in value can be shown on the same chart. Typically this finds use in scientific applications such as charting sound pressure changes measured in dB (decibels).

Macro – In spreadsheet parlance a macro is a miniature program built from spreadsheet functions and (usually) special macro program functions. A macro is usually used to either automate certain operations or even build completely new meta-spreadsheet applications.

Worksheet – A *Maxiplan* spreadsheet. The term spreadsheet can be used to refer to the spreadsheet application program or an open spreadsheet window where you do your work: hence the contraction, Worksheet.

the-dots pattern. This chart type offers a point-and-shoot facility to view specific values by clicking on them. An unusual function (also supported by 2D bar charts) is the ability to drag a data point and change its value in the sheet. Quite what use this could be put to is unclear, but I feel sure someone will find a use for it.

- **Step charts:** are really just a variation on the line theme. However, in this case rather than the data being rendered as a set of connected dots, it is shown as a set of steps.

- **Bar charts:** are offered in vertical orientation only – although this is the same as most of the competition and by far the most useful one. Three varieties are available – conventional, stacked and 3D. Data in the conventional 2D chart can be drag-edited, like that in the line chart. The 3D variation can be rotated interactively through two degrees of freedom – X or Y. The level of perspective cannot be altered though.

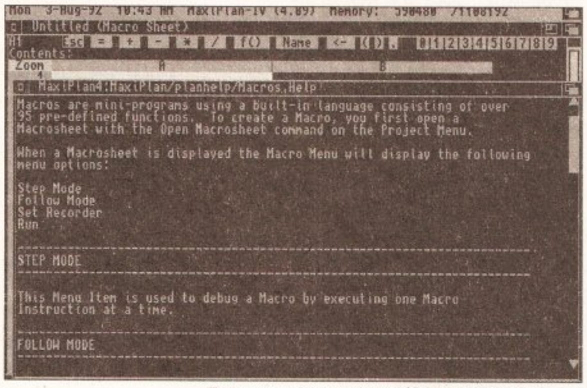
- **Area charts:** display the data as a line chart but with the area underneath filled in. *Maxiplan* only supports so-called stacked area charts where each plot is added to the last.

- **Hi-Lo charts:** are primarily used where two or three data points are required for each data item. Typically, this might be opening versus closing or high, low and closing prices on a stock exchange. They may also find use in some scientific applications – for instance the melting and boiling points of various solids.

- **X-Y charts:** are supposed to be the most powerful option since the X axis is automatically calculated. X-Y charts work like line charts although in this case all the points are connected.

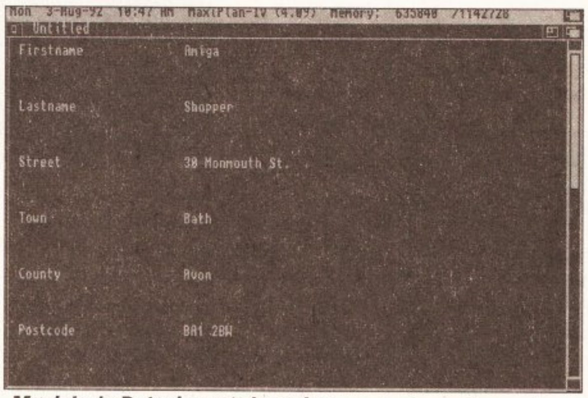
An enthusiastic user could turn such charts into drawings – a map of the USA is illustrated in the manuals but this does not appear on the distribution disks.

- **Text charts:** are *Maxiplan*'s answer to font handling. Rather than support many different fonts and styles within the chart body, the programmers have opted for a system whereby you enter the styles, font names and sizes, text, etc in a sheet and plot that range as a text chart. Text charts are actually more useful than they might sound since they can be used to provide "pages" within electronic presentations.



A macrosheet showing *Maxiplan*'s help facility. Shame about the lack of clarity for the drag bar...

- **Gantt charts:** are used in project planning – but a big question mark hangs over this area: does anyone use spreadsheets for project planning? The Gantt chart displays a project (job) as a series of horizontal lines – each specifying a "phase" within the job.



***Maxiplan*'s Dataview mode makes data entry a breeze even for a newcomer to the software**

As an example take the construction of a house: this separates into many tasks, some of which can be done at once, others that cannot. For instance the walls cannot be constructed before the foundations are laid and the roof cannot be put on until the walls are up. However, the plumbing and electrical systems can be added at the same time – usually before the plastering is completed.

Gantt charts are constructed using dates – as a real project would be planned. The dates shown in the 'sheet are used to compute the length and starting positions of each line. It sounds great, but there is a serious problem here.

Maxiplan uses internal numbers to compute the chart and seems completely unaware of time-critical events – weekends for instance. Also, it is left to the user to decide which events must complete before others start. In effect this makes the Gantt charting facility all but useless unless you write your own macros to take account of this.

As an aside, Oxxi-Aegis's *Superplan* spreadsheet can perform both these functions for you.

ABOUT DATAVIEW™

Many spreadsheets – certainly the better ones can be used as simple flat-file databases. However, it must be said there is no replacement for the real thing. *Maxiplan* goes one further with what the authors refer to as DataView mode.

Put simply, in DataView mode *Maxiplan* behaves more like a simple database than a spreadsheet.

DataView is entered by selecting a range of cells (the database) and selecting the mode. This changes the screen display to a record/field view and the only cells contained in the database are affected.

DataView mode certainly makes data editing and entry simpler and safer, but it is still a typical spreadsheet compromise.

MACROS ETC

Advanced users and programmers should be interested by *Maxiplan*'s extensive macro language. About 40 special commands are supported, plus commands to simulate most menu items plus all the normal spreadsheet functions: something like 70 of them – bring the total to nearly 200. Macros can be constructed entirely using the automated macro recording facility, built manually from the ground up, or in a combination.

Maxiplan macros are stored as special custom worksheets – called macrosheets. This apparently alien concept works very well in practice since the macrosheet has full access to any currently loaded worksheets; and can, of course, load any other worksheets it requires. Since macro execution can be automated, some users will only need to know how to load a sheet. Other applications include rolling demos including text and demographics.

Each macrosheet can hold up to a total of 64 named macro procedures, although there is no limit to the size of an individual macro. Interestingly, there is even a facility to single-step a macro program – that should make debugging a lot simpler.

CONCLUSION

The Disc Company's documentation describes *Maxiplan* as "the leading Amiga spreadsheet" something I would strongly dispute.

Powerful as it no doubt is, *Maxiplan 4* still retains the outdated interface it had years ago. Compared to Gold Disk's *Advantage* or *Professional Calc*, *Maxiplan* feels outdated, out-gunned and out-classed.

Worst of all *Maxiplan* has a nasty tendency to crash or just hang completely at unexpected moments – twice or more in a one hour session was not uncommon. Some people blame the Amiga, but remember, comparable applications such as *Pro Calc* manage just fine.

The authors would be well advised to examine how the program looks rather than add more features. As it stands, *Maxiplan* feels as if it was constructed *not* designed; and for that reason alone, I cannot recommend it.

Although there are few flaws in the package a good graphics designer and some better field testing couldn't rectify, they totally ruin what is essentially a very good piece of software. AS

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Priors Hardwick,
Nr Southam, Warwickshire
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☎ 0926 815855

CHECKOUT MAXIPLAN 4

Speed ●●●●○
Respectable but not outstanding.

Documentation ●●○○○
Poor layout and skimpy instructions make it difficult to use.

Functions ●●●●○
Sufficient for a vast range of applications.

Graphics ●●●○○
Easy to access – too many unnecessary features.

Ease of Use ●○○○○
Clumsy – a poor interface and confusing menu layout.

Value ●●○○○
Outdated, outmoded and costly.

Overall rating ●●●○○

Make a note: '*Maxiplan* must try harder'.

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AMIGADOS

Cracking the Shell

Mark Smiddy concludes his two part guide to programming a perpetual calendar in AmigaDOS. This month: completing the calendar module

One of the most irritating features of AmigaDOS must be its low speed – and the calendar script is no exception. However, any operation always seems quicker if you can see something happening. For instance, when Workbench is busy, it displays a sprite (clock or ZZZZ bubble) to show it's working; hacks such as Sleepy 3 go further by animating the sprite. So, we'll be taking a look at creating a progress indicator for your calendar. As promised, this month's feature also includes the listings for a modified version of *Calendar* which will send an entire 12 month calendar to disk or printer. It also features slightly improved algorithms.

Long operations should have some form of progress indicator and this is the method chosen for *Calendar*'s display module, *Monthprint*. The script's progress is shown in the form of a bar traversing the screen from 0 to 100 per cent completed.

Progress indicators can be implemented in several ways – the choice of which method to use depends on how the script works. In linear scripts you update the indicator at strategic points, after a long copying operation for instance. Looping scripts are easier, you update once every loop. In such cases it is also much easier to determine the length of the progress bar because you can usually determine how many loops will be performed in advance. This is the method used by *Monthprint* – the length of the progress indicator is calculated from the number of days in the month.

HOW IT WORKS Monthprint

1. Prints a simple message to let you know what's going on.

2. Displays the fixed part of the progress indicator bar using string slicing. For the sake of illustration, let's imagine the program was displaying a (purely hypothetical) seven day month. The variable "DiM" contains 8 (see last month's AmigaDOS column), so the printed result from this step looks like this. (The extra space is picked out with a period and the cursor position with an asterisk).

```
0%.——*
```

3. Adds the second part of the progress indicator. Note how this line looks a little strange at first glance. It sends a line feed, adds some spaces and then stops ECHO from printing a line feed. The screen display now looks like this:

```
0%.———.100%
...*
```

As you can see, the cursor has been moved to the first position in the progress indicator, just below the first bar. This explains the strange use of "*n" and NOLINE switch.

4. Defines a loop label "loop" which is accessed by the backward jump at 20. The loop is defined as early as is practical in the script to help speed things up. When jumping backwards, the SKIP command starts at the beginning of the program and works its way down. If you must jump backwards, keep the labels early on.

5. In BASIC this line reads:

```
IF DiM > daynum
```

This tests to see whether the value in "DiM" (days in month) has exceeded the value in "daynum" and branches accordingly. The variable daynum is initialised to "1" in the *Calendar* script detailed last month.

6. This calculates the value held in the global environment variable "wrap" which is used later to determine when to wrap the display. The variable "wrap" (explained in last month's installment) is calculated each loop to contain a value between 0 and 6 – the offset of the current date in the week. The calculation uses a technique which is not available in AmigaDOS 1.3 since it writes directly to the variable being used. In early versions, EVAL opens a file to the variable and keeps it open until the command has completed. Since you cannot write to a file which is open for reading, this was not possible. Assuming "wrap" contains 5, AmigaDOS treats this line thus:

```
EVAL (5 +1) mod 7 to ENV:wrap
```

The file containing the variable is opened, read and closed, while the line is being parsed.

When EVAL gets round to executing it sees the variable just as if it had been typed.

7. In BASIC this line could be written:

LISTING: MONTHPRINT

```
1. echo "Calendar Working... wait"
2. echo "0% ——————————————" first=1 len=$DiM noline
3. echo "— 100%*n   " noline
4. lab loop
5. if val $DiM GT $daynum
6. eval ( $wrap +1) mod 7 to env:wrap
7. if val $daynum NOT GT 9
8. echo >>T:MFile " " NOLINE
9. endif
10. if val $wrap NOT.GT 1
11. echo >>T:MFile "*e[32m$daynum*e[31m" "*e[I" noline
12. else
13. echo >>T:MFile $daynum "*e[I" noline
14. endif
15. eval $daynum + 1 to env:daynum
16. if $wrap eq 0
17. echo >>T:Mfile ""
18. endif
19. echo "*e[41m *e[40m" noline
20. skip loop back
21. endif
22. echo >>T:Mfile ↵
"*n=================================================="
23. more T:Mfile
24. resident eval remove
25. endcli
```

```
IF daynum <= 9
```

The test determines if the value stored in "daynum" is less than or equal to 9. If the test is positive, control branches to Step 9, otherwise it continues...

8. ...here where a single space is added to the print file, "MFile". (Mfile was created by *Calendar* and described in last month's installment).

This handles the character alignment by making sure all the numbers line up neatly. Since all the numbers appear at regular tab stops (accomplished with the string *e[I), single digits line up over the tens column, viz:

```
 1    1
 8    8
15   15
```

You may exclude Steps 7 to 9 if you wish.

9. Closes the IF/ENDIF construct opened at Step 7.

10. Tests if the value of "wrap" is less than equal to 1. (These values occur when the day is a Saturday or Sunday). If it is, control continues at Step 11 otherwise it branches to Step 12.

11. Control reaches here if the date displayed falls on a weekend.

This exception is highlighted by adding control characters to the output string: "*e[32m" turns printed output white and "*e[31m" puts it back to normal. See Step 13 for more info.

12. If control reaches here from Step 11 it branches to Step 14 otherwise it continues...

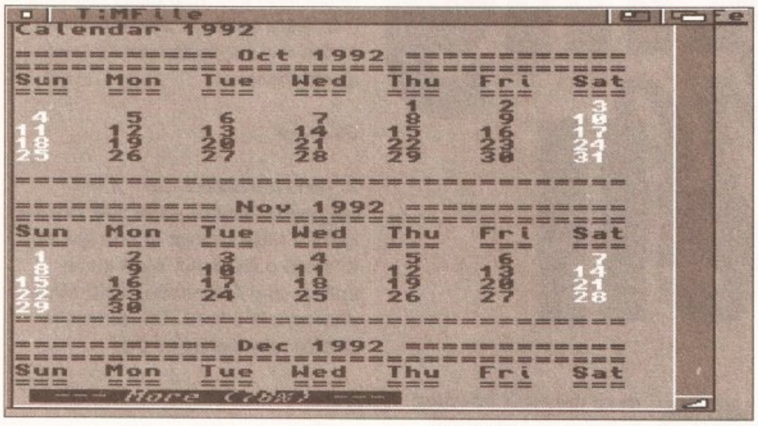
13. ...here, where it prints the next day number. A couple of things are worth noting here. First the output is sent to file for later display, but second two separate items are being printed. There's nothing unusual in that, but look at how this is achieved:

```
echo >>T:MFile $daynum ↵
"*e[I" noline
```

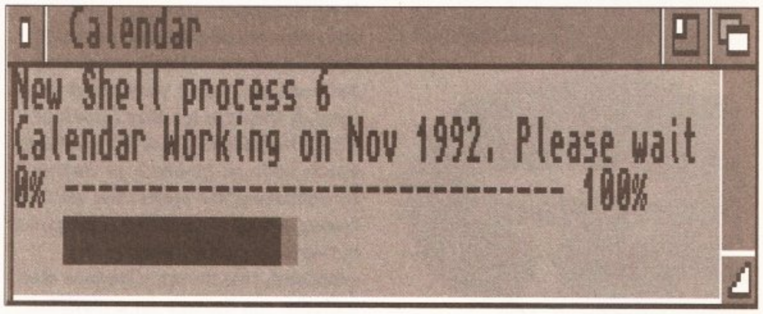
ECHO is receiving two print arguments ($daynum and "*e[I") instead of the more usual one. This is a unique feature of AmigaDOS 2 and cannot be used in earlier versions. In fact, you can send as many arguments as you like, switches such as NOLINE should be added to the end for clarity.

14. Closes the IF/ELSE/ENDIF construct opened at Step 10.

15. Increments the variable "daynum" using the direct write technique described at Step 6.



With a couple of months to a view on the perpetual calendar, you'll never be left wondering what day it is again



A progress monitor is just the thing for whiling away the time as the calendar calculates the dates and the days. Here, as you see, the job is nearly done

16. Checks if the value held in "wrap" is zero. If it is, control resumes at Step 17 otherwise it jumps to Step 18.

17. Adds a new line to the print file "MFile".

18. Closes the IF/ELSE/ENDIF construct opened at Step 16.

19. This displays the progress meter block for the current loop. Note this is echoed directly to the current console screen and not sent to file.

20. Jumps back to Step 4 for another bite at the cherry.

21. Closes the IF/ELSE/ENDIF construct opened at Step 5. Control reaches here when the entire month has been sent to the print file.

22. Appends the bottom "ruler" to the print file...

23. ...which is finally displayed here using MORE. Note that since MORE is not RUN-launched is uses the current Shell window for display. This also clears the progress indicator.

24. This removes EVAL from the resident list since it is no longer required...

25. ...and closes the Shell process opened by *Calendar.*

LISTING: SUPERCAL

```
1.  .key Year/A,Month
2.  .def Month 1
3.  if *$Calendar EQ $Calendar
4.  setenv Calendar ON
5.  resident c:eval add
6.  echo >T:MFile "Calendar <Year>"
7.  endif
8.  setenv MN <Month>
9.  echo "Working on $MN/<Year>"
10. execute s:Calendar2 <Year> $MN
11. eval $MN + 1 to ENV:MN
12. if val $MN NOT GT 12
13. execute s:Supercal <Year> $MN
14. endif
15. more T:MFile
16. resident eval remove
17. copy T:MFile to S:Calendar<Year>
18. echo "Calendar saved to disk as Calendar<Year>I*nSee ↵
magazine for info on how to print this."
19. quit
```

HOW IT WORKS
Supercal

Supercal is the main module for *Calendar2*, the whole year calendar. For the sake of speed, it operates as a separate module which calls modified versions of *Calendar* and *Monthprint.*

1. Define the key for this command. You must specify a year for this script and optionally a starting month. For instance you might only want the calendar from August 1992. Note however, both these arguments are numeric.

2. Just in case you don't supply a month, *Supercal* assumes you mean January – this will normally be the case since *Supercal* is designed to display whole year calendars.

3. This checks whether or not the *Calendar* variable has been set – this is used to check for certain once only configuration. If *Calendar* exists control branches to Step 7, otherwise execution continues...

4. ...here, where the *Calendar* variable is defined.

5. Adds EVAL command to resident list – this used to be done in *Calendar*, but since this is now a subroutine, it is done here.

6. Creates the print file and defines its heading with the current year.

7. Closes the IF/ENDIF construct opened at Step 3.

8. Defines a global environmental variable MN and gives it the value of the current month.

9. Prints a simple progress message in the current console window. This is the working window that *Supercal* was launched from.

10. Executes *Calendar2* (which is listed on the folllowing page) with

continued on page 125

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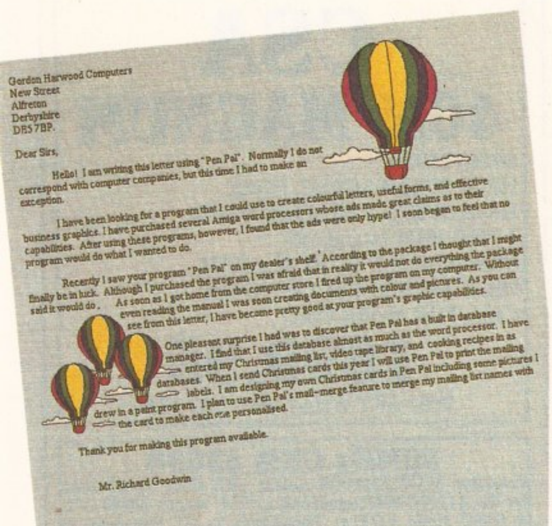
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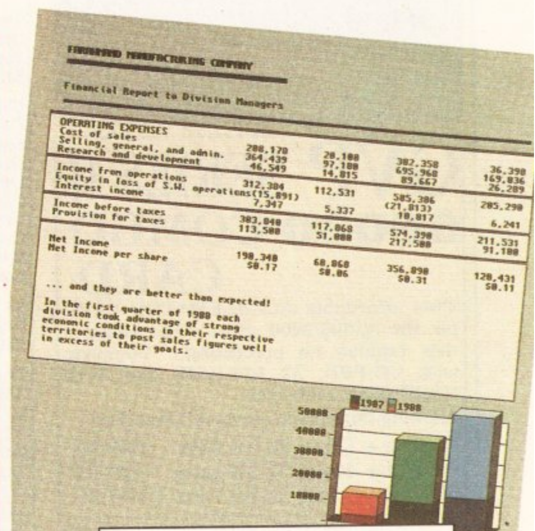
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continued from page 122

the correct parameters.

11. Increments the month number.

12. Tests if the whole year (up to December has been done). If it has, execution branches to Step 14 otherwise it continues…

13. …here, which calls *Supercal* itself recursively. This has been done in preference to using RUN because that would cause more than one occurrence of *Calendar2* to execute at once and that cannot happen.

Using EXECUTE on its own does not work because this script contains a backward loop and the temporary command file required by the SKIP command is trashed by the second EXECUTE running from the same process.

(Phew!) Don't worry, it just works that way.

14. Closes the IF/ENDIF construct opened at 12.

15. Displays the completed calendar.

16. Removes EVAL from the resident list since we've finished with it.

17. Makes a copy of the print file in your S: assignment…

18. …and lets you know for future reference. This is the print file. You can make your own calendar by copying this to your printer thus:

```
COPY S:Calendar1992 to PRT:
```

19. Purges the *Calendar* variable from the system.

32. $Day is now multiplied by 5 to account for new spacing.

37. A new variable has been added here to aid the multi-tasking. "Breakme" is set to the current process number running *Calendar2*.

LISTING: MONTHPRINT 2

```
1.  echo "Calendar Working on $MName $Y. Please wait"
2.  echo "0% ——————————————" first=1 len=$DiM noline
3.  echo "– 100%*n   " noline
4.  lab loop
5.  if val $DIM GT $daynum
6.  eval ( $wrap +1) mod 7 to env:wrap
7.  if val $daynum NOT GT 9
8.  echo >>T:MFile " " noline
9.  endif
10. if val $wrap NOT GT 1
11. echo >>T:MFile "*e[32m$daynum*e[31m" "  " noline
12. else
13. echo >>T:MFile $daynum "  " noline
14. endif
15. eval $daynum + 1 to env:daynum
16. if $wrap eq 0
17. echo >>T:Mfile ""
18. endif
19. echo "*e[41m *e[40m" noline
20. skip loop back
21. endif
22. echo >>T:Mfile "*n================================"
23. break $BreakMe C
24. endcli
```

LISTING: CALENDAR2

```
1.  .key year/a,month
2.  .bra {
3.  .ket }
4.  .dollar !
5.  set M {month}
6.  set Y {year}
7.  eval $Y-1 to env:Date
8.  eval $M-1 to env:month
9.  echo "$Date" first=1 len=2 to env:Cent
10. echo "$Date"          len=2 to env:decade
11. eval (799+ $decade+($decade/4)+($cent/4)-(2* $cent)) ↵
mod 7 to env:day
12. eval (($Cent+1)+$Y) mod 4 to env:leap
13. if val $leap NOT EQ 0
14. eval $month  * 3 +2 to env:slice
15. echo " 31 28 31 30 31 30 31 31 30 31 30 31" ↵
first=$slice len=2 to env:DIM
16. eval $month  * 4 +2 to env:slice
17. echo "  00  31  59  90 120 151 181 212 243 273 304 334" ↵
first=$slice len=3 to env:Elapsed
18. else
19. eval $month  * 3 +2 to env:slice
20. echo " 31 29 31 30 31 30 31 31 30 31 30 31" ↵
first=$slice len=2 to env:DIM
21. eval $month  * 4 +2 to env:slice
22. echo "  00  31  60  91 121 152 182 213 244 274 305 335" ↵
first=$slice len=3 to env:Elapsed
23. endif
24. eval $month  * 4 +2 to env:slice
25. echo  >ENV:MName " Jan Feb Mar Apr May Jun Jul Aug Sep ↵
Oct Nov Dec" first=$slice len=3 noline
26. echo >>T:MFile "*n=========== $MName $Y ==========="
27. echo >>T:MFile "================================="
28. echo >>T:Mfile "Sun  Mon  Tue  Wed  Thu  Fri  Sat"
29. echo >>T:MFile "===  ===  ===  ===  ===  ===  ==="
30. eval $day to env:wrap
31. eval ( $Elapsed + $Day ) mod 7 to env:Day
32. eval $day * 5 to env:space
33. echo >>T:MFile "                              " first=1 len=$space ↵
noline
34. setenv daynum 1
35. eval $DiM + 1 to env:DiM
36. eval $day to env:wrap
37. setenv BreakMe $process
38. newshell from s:MonthPrint2  con:0/0/360/50/Calendar/Auto
39. wait >NIL: 20 mins
```

20. Finally, this line makes certain that no recursive copies of the script are left to execute.

HOW IT WORKS Calendar2

Last month we had a slightly different version of this listing. This modified version is new and improved.

There are only a few changes between this version and the one listed last month. Follow them through to see how the code has been improved (line numbers refer to this version):

25. The month string is now written to a global environmental variable.

26-29. Tabs removed and other cosmetic improvements.

38. NEWSHELL calls a different file and the window has been made smaller.

39. An extra line forces the script to wait until the *Monthprint2* process is completed. Redirection to NIL: is used to stop the "***Break" message appearing.

HOW IT WORKS Monthprint2

The following changes have been made to *Monthprint*:

1. Cosmetic change to be more informative.

11 & 13. Tabs replaced by spaces.

23. Signals to *Calendar2* it is safe to continue by breaking the wait state.

GOTTA PROBLEM?

If you get stuck with AmigaDOS or there is anything specific you would like to see covered here, drop a line detailing your conundrum to: Mark Smiddy, *Amiga Shopper*, 30 Monmouth Street, BATH BA1 2BW. Sorry, no personal correspondence can be entered into. You can EMail Mark Smiddy on CIX @ "SMIDOID".

LISTINGS LISTINGS

THIS MONTH: SENDING CONTROL CODES TO YOUR PRINTER

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What is more, the commands are not expressed as a series of escape codes, but as user-definable names. These must be put into the text file, preceded by two left parenthesis '(('. A translation file must be present in your s directory, listing all of the commands and the sequence of hexadecimal codes which they represent.

Thanks for your submission, Jason. Your cheque's in the post.

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```
; Printerceptor
Install
        move.l  4,a6
        move.l  #dosnam,a1
        move.l  #0,d0
        jsr     -552(a6)     ; Open dos ↵
library
        move.l  d0,a6
        move.l  #filnam,d1
        move.l  #1005,d2
        jsr     -30(a6)      ; Open ↵
script file
        tst.l   d0
        beq     cdos         ; No script? ↵
Time to leave!
        move.l  d0,file
        move.l  #-1,d2
        move.l  #1,d3
        move.l  d0,d1

        jsr     -66(a6)
        move.l  #0,d2
        move.l  #-1,d3
        move.l  file,d1
        jsr     -66(a6)
```

These two seek calls are used to find out how long the script file is

```
        add.l   #1,d0
        move.l  d0,d7
        move.l  a6,dos
        move.l  4,a6
        move.l  #1,d1

        jsr     -198(a6)
        tst.l   d0
        beq     dae
        move.l  dos,a6
        move.l  d0,a5
        move.l  d7,d3
        move.l  d0,d2
        move.l  file,d1
        move.l  d7,fsize
```

This call reserves some memory so the script can be read from its file and stored internally. A check is made to ensure enough memory is available

```
        jsr     -42(a6)      ; ↵
Load the file
        move.l  file,d1
        jsr     -36(a6)
        move.l  d7,d6
        sub.l   #1,d6

        move.w  #0,d7
        move.l  a5,a0
l1      move.b  (a0)+,d0
        sub.l   #1,d6
        bmi     ccend
        cmp.b   #10,d0
        beq     ccend
        cmp.w   #32,d0
        bne     l1
        cmp.b   #10,(a0)
        beq     error2
fnl     move.b  (a0)+,d0
        sub.l   #1,d6
        bmi     ccend
        cmp.b   #10,d0
        beq     nexlin
        cmp.b   #48,d0
        blt     error2
        cmp.b   #$66,d0
        bgt     error2
        cmp.b   #58,d0
        blt     in
        cmp.b   #$61,d0
        blt     error2
in      bra     fnl
nexlin  add.w   #1,d7
        bra     l1
ccend   tst.w   d7
        beq     error2
        move.w  d7,d0
        mulu    #24,d0
        move.l  #$10001,d1
        move.l  4,a6
        jsr     -198(a6)     ; Reserve ↵
```

This next section does a quick syntax check on the script and counts the commands. Any errors in the script and the program will terminate and report an error

```
some memory for
        tst.l   d0           ; the ↵
command table
        beq     dae
        move.l  d0,table

        sub.w   #1,d7
        move.w  d7,d6
        move.l  #hexdec,a3
        move.l  d0,a0
        move.l  a5,a1
sloop   move.l  a0,a2
        move.w  #0,d5
mloop   move.b  (a1)+,d0
        cmp.b   #32,d0
        beq     num
        move.b  d0,(a2)+
        add.w   #1,d5
        cmp.w   #15,d5
        blt     mloop
fsp     cmp.b   #32,(a1)+
        bne     fsp
num     move.w  #0,d4
        lea     16(a0),a2
loop2   move.b  (a1)+,d0
        cmp.b   #10,d0
        beq     exit
        move.b  (a1)+,d1
        cmp.b   #10,d1
        beq     error
        and.w   #31,d0
        and.w   #31,d1
        move.b  (a3,d0),d0
        move.b  (a3,d1),d1
        lsl.b   #4,d0
        or.b    d1,d0
        move.b  d0,(a2)+
        add.w   #1,d4
        cmp.w   #7,d4
        blt     loop2
exit    move.b  #$ff,(a2)+
```

This next part is the script parsing routine. It converts the script into a format more readily understandable by the program (hence less so by people). Once in this format the script can be cross-referenced much more quickly (see the script panel on the next page for more details). At this time each of the commands are checked to ensure their names are long enough

```
        add.w   #2,d5
        cmp.w   d4,d5
        blt     error
        add.l   #24,a0
        dbf     d6,sloop
        move.w  d7,commands
```

Now the initialisation has been performed, we can set up the program for action. This part of the program is known as the 'wedge', since it slots between the printer driver and the printer device

```
        move.l  4,a6
        move.l  #devnam,a0
        lea     ioreq,a1
        clr.l   d1
        clr.l   d0
        jsr     -444(a6)
        tst.l   d0
        bmi     dae
        lea     ioreq,a1
        move.l  20(a1),a4
        move.l  -$1c(a4),j+2
        move.l  #end-start,d0
        move.l  #1,d1
        jsr     -198(a6)
        tst.l   d0
        beq     dae
        move.l  d0,a0
        move.l  #start,a1
        move.l  #(end-start)/4,d1
Il1     move.l  (a1)+,(a0)+
        dbf     d1,Il1
        move.l  d0,-$1c(a4)
        lea     ioreq,a1
        jsr     -450(a6)
```

All finished! All we have to do now is close up and return

```
dae     bsr     dafil
cdos    move.l  dos,a1
        move.l  4,a6
        jsr     -414(a6)
out
        rts
```

The error handling routine. Only one error message is given, although it can be generated by different circumstances. There are two entry points for the routine, depending on the cause of the error

```
error   bsr     datab
error2  bsr     dafil
        move.l  dos,a6
        jsr     -60(a6)
        move.l  d0,d7
        move.l  d0,d1
        move.l  #erstr,d2
        move.l  #enstr- ↵
erstr,d3
        jsr     -48(a6)
        bra     cdos
dafil   move.l  a5,a1
        move.l  fsize,d0
        move.l  4,a6
        jsr     -210(a6)
        rts
datab   move.l  table,a1
        move.l  tsize,d0
        move.l  4,a6
        jsr     -210(a6)
        rts
```

All code between the labels 'start' and 'end' is part of the wedge, and must be PC Relative

```
start
        movem.l a0-a6/d0-d7,-(a7)
```

The following four lines have been documented out. They check if it is the printer device using the port. They were taken out in case a program used its own printer driver. They are only really necessary if you have another output device on the port

```
*       move.l  14(a1),a0
*       move.l  10(a0),a0
*       cmp.l   #'prin',(a0)
*       bne     out2

        move.w  38(a1),d7
        sub.w   #3,d7
        bmi     out2
        move.l  40(a1),a0
        move.l  a0,a2
loop    cmp.b   #'(',(a0)
        beq     maybe
not     move.b  (a0)+,(a2)+
not2    dbf     d7,loop
        move.b  (a0)+,(a2)+
        move.b  (a0)+,(a2)+
        sub.l   a2,a0
        move.l  a0,d0
        sub.l   d0,36(a1)
out2    movem.l (a7)+,a0-a6/d0-d7
j       jmp     0
maybe   cmp.b   #'(',1(a0)
        bne     not
        move.l  table(pc),a5
        move.w  commands(pc),d0
bccl
        move.l  a5,a4
        lea     2(a0),a3
ccl
        cmp.b   (a4)+,(a3)+
        bne     ntc
        tst.b   (a4)
        bne     ccl
        move.l  a3,a0
        lea     16(a5),a4
fccl
        move.b  (a4)+,(a2)+
        cmp.b   #255,(a4)
        bne     fccl
        bra     not2
ntc
        add.l   #24,a5
        dbf     d0,bccl
        bra     not
table   dc.l    0
commands
        dc.w    0
end
fsize   dc.l    0
tsize   dc.l    0
file    dc.l    0
dos     dc.l    0
devnam  dc.b    "parallel.device",0
```

Change the text above in quotes to 'serial.device' if your printer is connected to the serial port

```
        EVEN
dosnam  dc.b    "dos.library",0
        EVEN
erstr   dc.b    10,$9b,"1;33;40mAwooga, ↵
Awooga!!",$9b,"0;31;40m",10,10
        dc.b    "Error in script file ↵
format. Printerceptor installation ↵
terminated.",10
        dc.b    "Please check file and ↵
retry.",10,10
enstr
        EVEN
filnam  dc.b    "s:PrintCommands",0
        EVEN
hexdec  dc.b    0,10,11,12,13,14,15,0
        dc.l    0,0
        dc.b    0,1,2,3,4,5,6,7
        dc.b    8,9,0,0,0,0,0,0
ioreq   dcb.w   24,0
```

THE SCRIPT FILE

***Printerceptor* needs a script file called *PrintCommands* which must be stored in the s directory of your boot disk.**

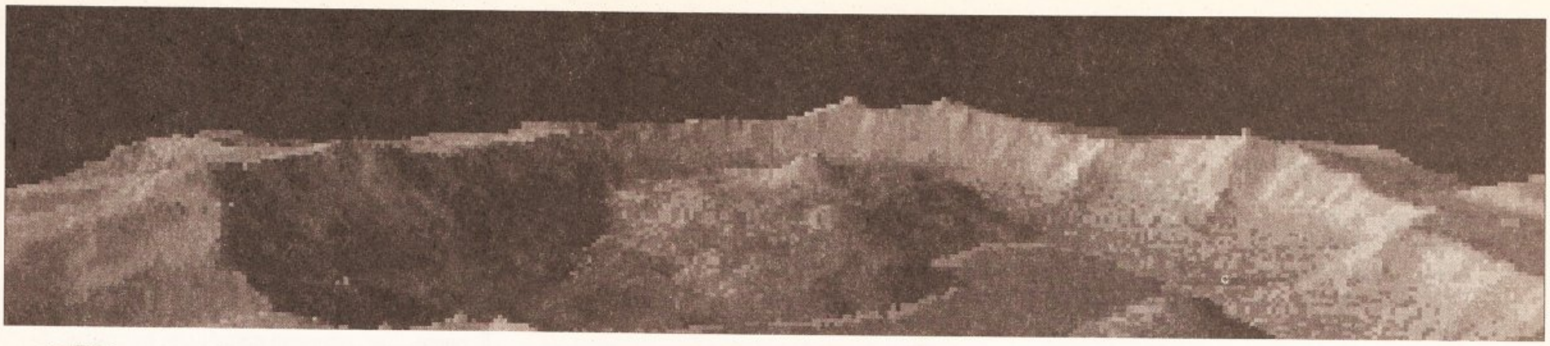
When a text file comes to be printed, *Printerceptor* will scan it for any embedded print commands. These are denoted by two open parentheses '((' followed by the command name. The command names can be chosen by the user. The script file acts as a dictionary: each time a command is found in a text file, *Printerceptor* looks it up in the script file and replaces it in the output to the printer with its corresponding hexadecimal codes.

Each command in the script must be on a separate line, with no blanks. First on the line must come the command name, which can contain any characters. *Printerceptor* is case-sensitive, and only takes notice of the first fifteen characters. Then follows a single space, and the hex codes for the printer to execute the command. The command name, plus the two brackets which precede it in a text file to be printed, must be longer than or the same length as the code sequence, otherwise an error will be generated. This will also happen if the hex string contains non hex or an odd number of characters. Hex letters must be lower case.

A blank line signals the end of the file (it's not necessary, but it is useful for adding a comment).

Below is an example script for the Star LC24-200. Users should create their own script files with reference to their printer manuals.

```
Center 1b6131
Just 1b6133
Left 1b6130
LQ 1b7831
Times 1b6b00
Sanserif 1b6b01
Courier 1b6b02
Prestige 1b6b03
Script 1b6b04
Italic 1b34
Upright 1b35
Emph 1b45
Noemph 1b46
Dubstr 1b47
Nodubstr 1b48
Underlin 1b2d31
Stpundlin 1b2d30
Outline 1b7131
Outshad 1b7133
Super 1b5330
Sub 1b5331
Cancscript 1b54
Pica 1b50
Elite 1b4d
Semicon 1b67
Condense 1b0f
Nocond 12
Width 1c45
Prop 1b7031
Fixed 1b7030
Size 1b68
Right 1b6132
Draft 1b7830
Shadow 1b7132
Norm 1b7130
```



SOFTWARE FOR FREE

Ian Wrigley rounds up what must be the most diverse collection of PD ever. From fractals to harpsichord recitals to discovering the secrets of the ancient runes, there's sure to be something here to suit all tastes. PLUS: all the latest disk mags

'Allo, boozers. Oh. Sorry, wrong magazine. Here we are again, getting to grips with the latest in PD, shareware and licenseware for the Amiga. As I sit here, looking at the piles of disks on the floor around my desk, I have to say that things have been getting sparser over the last few months. I don't know whether that's because fewer people are sending me stuff to review, but it seems to me that there is genuinely less freely-distributable software about. Disk magazines seem to be thriving – see later for reviews of a couple of the latest – and I'm getting a fair few letters from UK software authors who want me to take a look at their latest offerings. But, by and large, the PD scene just ain't what it was. So, if you've any shareware lurking about that you use but haven't bothered sending off the fee for, think about it: perhaps you, in your own small way, are contributing to the reduction in new programs. Get the chequebook out now!

BEGINNERS START HERE

What is PD?

PD is a general term which many people incorrectly use to refer to all freely-distributable software. In fact, PD (which stands for Public Domain) software is only one branch of this area; the other main one is shareware.

Essentially, PD software may be copied and used by anyone, although some authors place restrictions such as not allowing a PD library to charge more than a certain amount for the disk.

Shareware, on the other hand, should be treated more like commercial software.

Although you are allowed to copy and pass around shareware programs, if you like one then you should pay the requested fee to the author – it's normally only £15 or less, and often entitles you to an upgraded version or a printed manual.

Paying your shareware fees encourages software authors to write more programs – and if they don't, the Amiga scene will be a poorer place.

Can I pass other people copies of PD?

Yes – that's the way that it gets to a wide audience. Just make sure that you have followed the author's requirements for distribution – normally that you don't charge more than a certain amount for the disk, or that you make sure that all the documentation is included on the disk.

You can also pass on shareware – but not any registered copies of programs. If, when you pay your shareware fee, the author sends you an improved version of the program, then be careful not to give that out. You should only pass on unregistered shareware.

FRACSCAPE

Various PD libraries

First off this month is *Fracscape*, a PD fractal landscape generator by Lee Bull, which was written in Amos and compiled using the Amos compiler.

Lee says "I think it is better than any others currently in the public domain" – brave words!

The disk contains, according to the documentation, just one section of a full landscape design, generation and modelling package which may be released into the public domain at some stage in the future. Until then, all we have is the 3D modelling section.

The package was apparently written as an A-level project that took three weeks to complete – a pretty damned impressive feat.

Lee is now studying for a degree in computer science, but he can't be a total propellerhead: one of his doc files has the worthy suggestion: "If

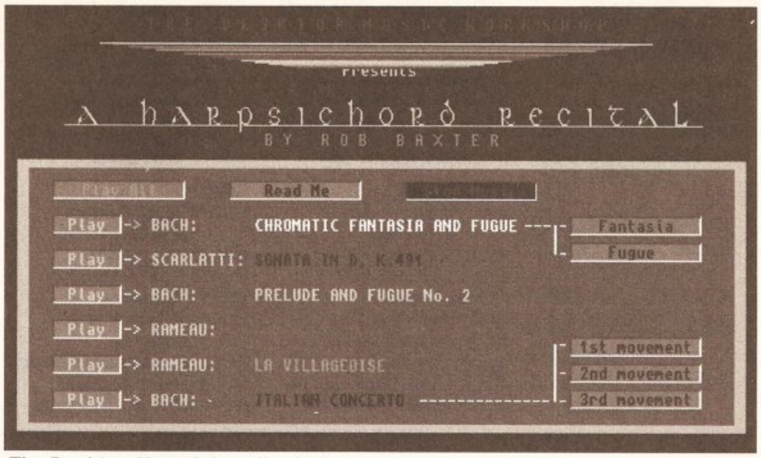
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RATING THE PROGRAMS

Just to be awkward, I rate the software that I review in two different ways, depending on what it is. Disk magazines, collections of clip art and the like are given a 'value for money' rating, since you're paying for one thing on the entire disk. Single programs which appear in a collection of others, or programs which I've downloaded from bulletin boards, are given a 'program rating', which reflects how good I think they are, taking into account usability, bug-proofness and so on. Both ratings are out of a maximum possible 10.



Because *Fracscape* doesn't multi-task, I can't grab any of the dialog boxes, however this sample image should give you an idea of its capabilities



The Desktop Harpsichord Recital's easy menus mean that even the complete Amiga novice can listen to the music

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you like the landscape piccies output by *Fracscape*, try getting away from a screen and looking at some real ones, they're much more believable." Nice one.

The program uses DEM files. DEM is short for Digital Elevation Model, and is a file which contains information about the formation of a landscape. The landscapes can be created mathematically, using fractal maths, or they can be constructed from real data about real landscapes.

Once a DEM has been generated or loaded, *Fracscape* can create a colourmap, which is a file that provides colouring for the landscape. Setting things like camera angles then allows the program to render the final image.

The generation of landscapes on screen can take some time – the documentation estimates that a 257 by 257 landscape will take about 45 minutes to create. On the other hand, the program has some powerful features built in – such as the ability to keep all the data in RAM, to save time during the processing.

> *"Written as an A level project in three weeks, Fracscape is a pretty impressive feat."*

Fracscape has a *Vista*-style interface – indeed, Lee thanks Virtual Reality Labs for the *Vista* series of programs, and suggests that if you like his program, you go out and buy *VistaPro*. It's easy to use, and a fair amount of thought has clearly gone into the user interface.

Dialog boxes are clear and uncluttered and, except for occasional confusion as to exactly where to click to change a parameter, the program should provide no problems for anyone who's used anything created in AMOS before.

Overall, *Fracscape* is a very impressive piece of work. I have a couple of criticisms, but they're not really aimed at Lee's work – more the AMOS creation environment. The program doesn't multitask – at least, I couldn't return to the Workbench screen after it was running – and I hate the AMOS file selector dialog. However, if you want a fractal landscape generator, I strongly suggest that you get hold of this program.

Lee has sent it to a number of PD libraries, including 17 Bit software and PDSoft, so it should be appearing in their catalogues real soon now. And I just hope that Lee continues in this vein – his doc files suggest that he's likely to start work on a 24-bit rendering package when he's got the time, and judging by his work to date it will be a program well worth seeing.

Program rating....................9/10

REVIEWED THIS MONTH

••• THE BEST ON TEST •••

Fracscape	An excellent *Vista*-style fractal landscape generator. Believe it or not, this one was created as part of an A level project and has now made its way on to the PD scene.
Desktop Harpsichord	Well-written music disk – ideal for anyone with an interest in high class music on the Amiga.
Mysteries of Runes	Discover the secrets of the ancients – definitely one for the New Age fanatics amongst you...
Frac	Fantasy Role-playing Adventure Creator – if you've got an idea for a game, this could be just what you need to put your ideas into action. Makes life easy for any budding role playing game writers.
Power Text	Impressive word processing power for next to nothing. It's powerful, it's fast and probably 30 or 40 times cheaper than a commercial offering. Packed with features.

AND THE REST...

Mega-Station	The "complete" CLI work station. A collection of utilities for your machine.
C:commands & fonts	Collection of new and replacement CLI commands.
WBase	Mini database which can be accessed from the Workbench screen.

DESKTOP HARPSICHORD RECITAL

By Rob Baxter

Available from various PD libraries

You may remember that I reviewed *Classix 1*, a disk of music by Rob Baxter, in the August 1992 edition of *Amiga Shopper*. Well, Rob has dropped me a line to let me know about his latest disk, the *Desktop Harpsichord Recital*. This is the tenth musical disk that Rob has put together (*Classix 1* was in fact the first), and very good it is too.

Unlike Rob's earlier musical efforts, this disk concentrates on one instrument – the harpsichord – and he has collected together six pieces written for that instrument. These comprise three by Bach, two by Rameau and one by Scarlatti. Of the Bach pieces, one is in two movements and one – the Italian Concerto – has three.

> *"The disk includes a set of notes on how the music was created."*

The harpsichord sound used to play the music is really rather good. It still sounds slightly electronic, but that's almost impossible to avoid. Certainly, given that it's only likely to be played through a monitor or TV speaker anyway, it's totally adequate. Selecting the music is a simple matter of clicking on the required piece – or, if you want a whole recital, clicking on the 'play all' button.

continued on page 133

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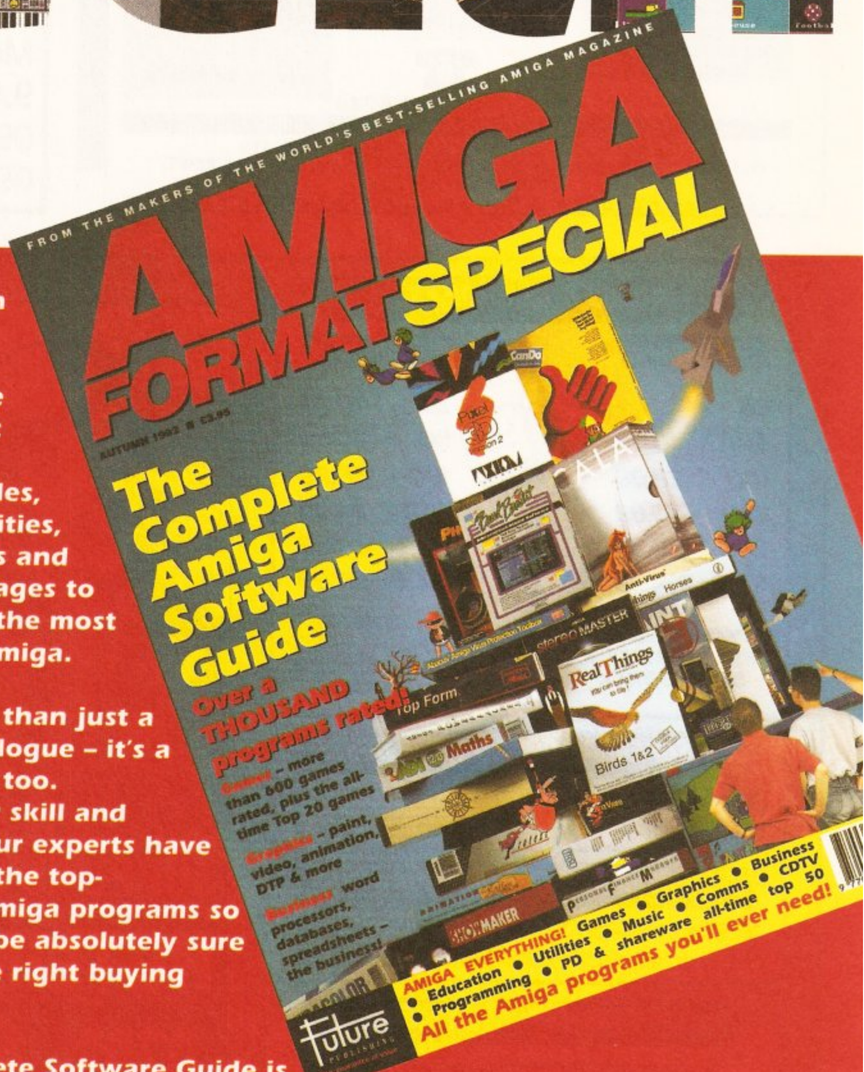
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The disk is self-booting, so the program runs automatically.

As well as the music itself, Rob has included a well-written set of notes which discuss how the music was created (the harpsichord sounds were created in E-Z FM), and talk about the pieces themselves. It's an interesting read, although it's a shame that you can't read the text and listen to the music at the same time.

The music is well performed, and I can certainly recommend this disk to anyone interested in high-class music on the Amiga.

Value for money..................9/10

THE MYSTERIES OF RUNES

Roberta Smith
DTP disk OS125

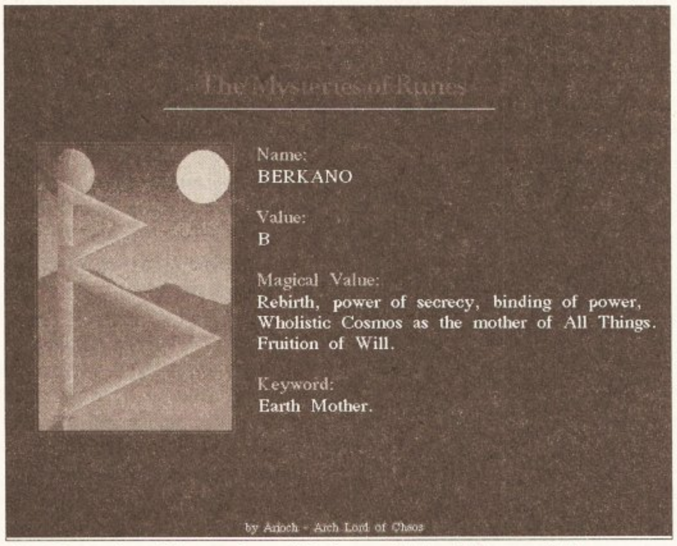
The Mysteries of Runes is a slideshow disk containing a sequence of images of Runes, along with an explanation of them. Runes, according to the loading screen, as "the sacred symbols of the Teutonic races, and in the far past, a complete system of philosophy and magic was erected upon them. This system was handed down from shaman to pupil by word of mouth using the Runes themselves as mnemonics." Hmmm...

> **"A complete system of philosophy and magic was erected upon the Runes."**

Anyway, the disk runs as a slideshow in overscanned mode, and the illustrations are well drawn. Arioch, the creator of the disk, has obviously gone to a fair bit of trouble to put together an attractive set of images. The screens are saved as IFF images, so they can be imported into other packages capable of reading the format. The disk is charityware – if you like it, send a donation to your favourite charity.

I'm not quite sure who will use this disk; surely if you follow the ancient ways, you're not likely to have an Amiga sitting on your desk? Or perhaps you are. Anyway, if you fall into this category, the disk can be recommended. If you don't, save your money.

Value for money..................5/10



***The Mysteries of Runes* is a slideshow which will be useful to students of the ancient ways. Or nutters. Or both...**

FRAC

Amiganuts disk 1251

It's a while since we've seen anything from Amiganuts, and it's nice to see Ray sending stuff in again. *Frac* stands for Fantasy Role-playing Adventure Creator, and was created by Derek Whiteman of Mid Glamorgan in South Wales. Like *Fracscape*, it was created as an A-level project – I wonder if the examiners realise how many of these projects find their way into the Amiga public domain after the exams have been taken!

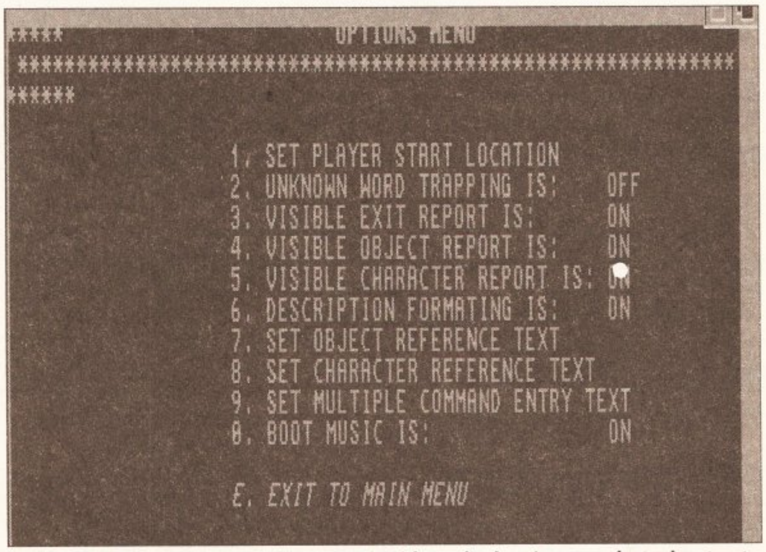
The program allows a user to create their own adventure game, which can then be saved to disk and distributed. Because it was created for an A-level course, the documentation consists of the project report – which, I must say, goes on for quite some time before it actually gets to the nitty-gritty of how to use the thing.

On the other hand, I guess that anyone who doesn't know the history of computer adventure games may find it interesting. It's certainly fairly well written, so it isn't a pain to read, unlike some program documentation.

You create your adventure using *Frac*'s built-in programming language, Fractol (Fantasy Role-playing Adventure CreaTor Operating Language). It's quite similar to Basic, but provides a range of new commands specifically for things like text parsing.

To be honest, this is where the documentation becomes something of a pain. You really need to print it all out and read it before you get started – and there's a hell of a lot of it.

The creation environment is totally text-based – indeed, the cursor was totally disabled when booting from the disk. This means that those only used to the Amiga's Workbench environment may be a little unhappy, although since much of your time will be spent programming the thing, it's not really a problem.



***Frac* enables you to create your own text-based adventures, using a language which is similar to Basic in many ways**

There's no point going in to exactly how *Frac* works here – if you're interested so far, send off for the disk, it's only £2 – but briefly, you set up a map, place objects where you want them to be found and then write the procedures which will be activated when a user uses any specific verb-noun combination. There's support for synonyms of words, so there's no excuse for users of your adventure to complain that "I have to type 'fast flowing river' every time, when I just want to type 'water'."

> **"Frac supports the use of graphics and SoundTracker modules, so the games you create needn't be just text-based."**

Frac supports the display of graphics and will play SoundTracker modules, so the games that you create don't need to be just text-based, and the author is currently working on a version which will cope with music composed using *OctaMED*.

This is not a program that you're going to be totally familiar with in an evening.

Creating an adventure will take work – lots of it. But when you've finished, *Frac* allows you to make a stand-alone disk with your creation on it, for distribution. If you fancy having a bash at writing an adventure game, and you're not scared of getting your hands dirty with a little basic Basic programming, *Frac* can be highly recommended.

Value for money..................8/10

>>>>> READ UP ON ALL THE LATEST DISK MAGS – THIS MONTH LOOK OUT FOR SCANNER ISSUE 8, AMIGA MAG VOLUME 2 AND TDH 3 >>>>>

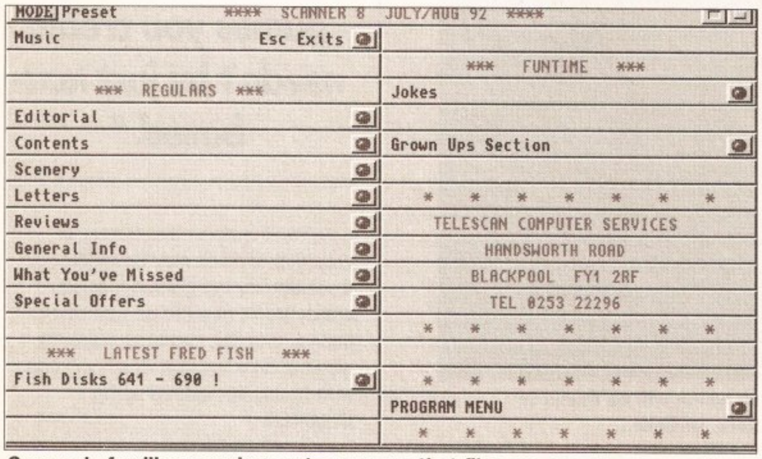
POWER TEXT

Deja Vu Licenseware

Power Text, by Gary Stimson, is a most impressive word processor. It is written in compiled AMOS, and seems to have all the features that most people will want.

Unlike many word processors these days, *Power Text* doesn't provide a WYSIWYG (what you see is what you get) display on the screen. Instead, the text is displayed with no justification, style or whatever. Now, different people prefer different methods of working, but the big advantage of non-styled text display is that it tends to be far faster to get around a document, and inserting words doesn't leave you waiting while the program calculates what to do with the word wrapping in the rest of the paragraph. In an ideal world, a word processor would display text formatted on-screen, exactly as it will print out – and it would do this with no speed penalty. Sadly, this ain't the real world, and Gary's method is a reasonable compromise.

To format a document – define that paragraphs are justified, words are bold italic and so on – you hit the Escape key and then enter a short word, known as an embedded command. This took me right back to my days of wordprocessing on the BBC Micro, and I was soon at home using the commands. Until you can remember all the commands, it's a good idea to print out the manual and leave it open at the relevant page. You'll soon have no problem with the general ones, though: 'left' left-justifies text, 'lmar n' sets the left margin at column 'n' and so on. The program sends output to the standard PRT: port, so you'll have to have the correct printer driver set up in your Workbench Preferences. You can embed printer control codes in a document, so there are no problems accessing your particular printer's special features.



***Scanner*'s familiar menuing system means that files are easy to access. As you can see, there's quite a lot on offer this month**

> ***"Power Text proves that AMOS is a development system capable of creating much more than just games."***

So far, the program appears merely very good. But it's the extras that really make it an outstanding offering. For starters, unlike many other PD, shareware and licenseware word processors, *Power Text* copes with things like headers and footers with ease. It can mail merge with a standard ASCII file. It automatically sizes its screen for PAL or NTSC Amigas. It has an auto-save feature which saves the file you're working on to disk at regular intervals.

One really neat feature is the 'double sided printing' option. When this is selected, odd-numbered pages are printed first, then you are prompted to turn over your paper and the even-numbered pages are output. This way, your documents are output double-sided, without having to swap each page. And, of course, it means that people using continuous paper can also get double-sided output.

Moving about the document is easy: as well as using the cursor keys, a scroll bar on the right-hand side of the screen displays your current position in the file, and the mouse can be used to move the 'thumbwheel' to a new point. Clicking on a character with the mouse moves the cursor to that character (unlike at least one other PD offering, where clicking with the mouse had no effect on the cursor at all).

There is a built-in spelling checker in the program, as well as a word-count facility. Both work fast, and the spelling checker displays three lines of text whenever a suspect word is discovered – so you can see the context that it's used in. You can, of course, add words to the dictionary, and the program can suggest alternatives to any misspelt word. If you don't want to add a word to the dictionary but you don't want to have the checker stop each time it finds it, select 'Ignore' and it won't be flagged again during the check.

Function keys can have strings assigned to them ('Yours faithfully' and so on), and these can be saved so that they are available the next time you run the program. The Find command works forwards or backwards through the document, and case sensitivity is switchable.

Although the program uses its own format to save documents (denoted by the '.PTXT' suffix added to files), it can save and load ASCII documents. Two versions are supplied: one for 512K machines, which can handle files of up to 500 lines and which doesn't contain the spelling checker, one for machines with 1Mb or more of RAM, which can handle up to 2,500 line documents. The 500 line restriction in the 512K version could prove a problem for anyone trying to print out the documentation – the manual is 1135 lines long, so you'd have to use some other text viewing utility such as *MuchMore*.

I could go on and on about *Power Text* (I already have!). It really is a remarkably powerful, fast and well thought-out piece of software and, yet again, proves that AMOS is a development system capable of much more than just creating games. If you have a need for a word processor, I strongly suggest that you check out *Power Text* before you spend 30 or 40 times as much on a 'commercial' offering. In future, I'm likely to be using it rather than any other word processor on my machine – its elegance and range of features must be seen to be believed. Get it now!

Program rating.................10/10

DISK MAGAZINES

SCANNER Issue 8

It's time for the customary round-up of disk magazines again, starting with *Scanner* issue 8, from Telescan Computer Services.

Scanner comes on two disks, and auto-booting with the first one produces a loading screen, some music and the customary 'press right mouse button to actually see something useful' message. To be fair, the loading screen is actually quite good, but they do get a bit monotonous after a while...

Entering the main program produces the standard menu system used by many disk magazines these days, and reading the menu itself shows that once again, Telescan has packed loads on to the disks.

For the first time that I've seen, *Scanner* has a 'grown ups' section. This consists of three pictures and some jokes, and all four are password-protected. Clues to the passwords are hidden elsewhere in doc files on the disk, but it wouldn't take the average 12-year-old too long to find them (about as long as it took me, actually). On the other hand, the pics aren't particularly bad – one is quite funny, actually. It's up to you whether you want your kids to see them. A surprising decision to put this type of stuff on the disk, though.

The Editorial on the disk is written in Norman's inimitable style, and is nicely readable. It's interesting to read Editorials written by people who can write rather more personal stuff than we can in newsstand magazines – and Norman certainly seems to be having a rough

continued on page 136

HAMMING IT UP

No, the box title isn't a reference to 4096-colour Amiga screen modes. We're talking Amateur Radio here. The people at Aardvark PD have a total of 17 Ham radio disks in their collection, and they've sent me half a dozen to review.

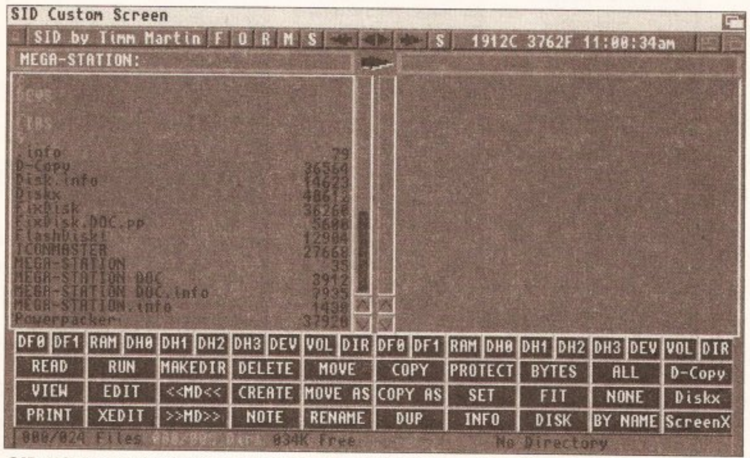
Unfortunately, almost of the programs are written in AmigaBASIC, which means that people with A500 Pluses and A600s won't find them of much use – AmigaBASIC wasn't shipped with those machines. Those who have a copy, though, are likely to find something of interest on at least one or two of the disks. For example, there is an RTTY program for anyone with a Kamtronics UTU interface, a program to output Morse at a user-defined rate, a contest logging program and several others on disk H/004. H/011 has a Packet Radio driver for TNCs like the KPC-2, PK88, PK232 and Kamtronics. If this sounds like the sort of thing that you spend your time wishing you had, drop Aardvark a line at 53 Cumberland Road, Loughborough, Leicestershire LE11 0DE for a full catalogue.

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time of it at the moment! There are also reviews of various PD and commercial programs, jokes, general information, letters, music and so on, along with a catalogue listing of Fred Fish disks 641 to 690 and a good range of PD and shareware programs on disk two. These include a rather primitive spreadsheet, *Text Engine v3*, *STD Index 1.1* (a phone code finder which will search for a town's code, or for the town which

four-function calculator invoked by hitting [Alt]-=, *BezSurf*, a program for producing bezier surfaces of revolution (it says 'ere) and several others. The collection isn't as good as some that I've seen, but it is still worth the £1.50 that the disk costs. Make cheques payable to P B Stanley and send them to him at 102 Kesteven Road, Stamford, Lincs PE9 1SS. Thinks: isn't Maggie now known as the Right Honourable Lady Thatch of Kesteven? Hmmm...

Value for money..................6/10



***SID II* is the driving force behind *Mega-Station*, a Workbench 2.0 replacement for those of you tired of the familiar interface**

has a specific code) and several others, plus some graphics files and games.

Even if you don't like the concept of disk magazines, *Scanner* is always good value for money just because of the range of programs it contains. The fact that the editorial content is usually good is an added bonus.

Scanner is bi-monthly, and costs £2.50 plus 50p postage and packaging. Annual subscriptions cost £15. Make cheques payable to N Jordan, and write to Telescan Computer Services, Handsworth Road, Blackpool FY1 2RF. Credit card orders are accepted for yearly subscriptions.

Value for money..................8/10

AMIGAMAG Vol 2

Amigamag is a rather younger publication than *Scanner* – it's only two issues old. Rather than using a menu system, you must boot from a Workbench disk before you can access the files, which are all double-clickable in the standard manner. After, that is, you've issued an 'assign' command from the Execute menu option or from a CLI. Apparently the next issue will be autobooting. There is very little editorial content, and most of the disk's contents – it is 96 per cent full, with only 37K of free space – taken up with programs. There's a backgammon game, the obligatory virus checker, a program called *CalcKey*, which is a memory-resident

TDH Issue 3

I reviewed the PD issue of *TDH* a couple of issues ago, so I thought that I should now look at a 'real issue'. Andrew Woods, one of the creators of the program, wrote to tell me that some of my complaints had been addressed – and, sure enough, when I accessed 'About the music' a message marked 'by the way, *Amiga Shopper*,' informed me that I can toggle the music on and off at will. It's nice to see that someone takes some notice of what I write!

TDH has an interesting way of accessing files: a logo screen appears, and clicking the right mouse button brings up a floating menu wherever the cursor is, with the articles listed. A neat idea. Some of the editorial has 'hot buttons'; that is, click on a word and you're taken to that section. I clicked on the word 'graphics' and was presented with a couple of stunning digitised pictures. Again, a neat idea indeed.

On the disk, apart from the editorial, are a couple of utilities, including one called GraphicWorkshop, which only runs on the PC or PC emulators. Quite what this is doing on an Amiga disk mag is a tad beyond me... Still, other utilities are custom-written for the disk, rather than just grabbed from PD libraries, which makes a nice change.

The text is attractively presented, with nice headers to each section. For a slightly different approach to disk magazines, why not check out *TDH* issue 3. I'm looking forward to seeing the next one – if it keeps improving at the current rate, it really will be stunning.

TDH issue 3 costs £2. Make cheques payable to 'TDH', and send them to Andrew Woods, *TDH* magazine, 1 Westwood Gardens, Scarborough, North Yorkshire.

Value for money..................8/10

UTILITIES

MEGA-STATION

Five-Star PD disk U195

Mega-Station bills itself as 'the complete CLI workstation'. It's an A500 Plus disk, although an A500 version is apparently 'nearly complete'. It was compiled by someone called Ralph, whose doc files caused me a chuckle or two: he notes that some of the programs are shareware, and asks that we 'please send a Donation to the approx author.' Er... how can you be approximately the author of something?

On booting, the standard Workbench appears, with probably the most hideous palette of colours I've ever seen. Even the menus have nasty graduated tints on them.

One slightly worrying thing is that the RAM disk doesn't automatically appear on boot-up. And the fact that About... tells me that I'm using version 1.0 of Workbench doesn't fill me with enormous confidence.

Anyway, at the heart of *Mega-Station* is *SID II*, which is used as the main navigation tool. The other utilities included are *Zero III*, a virus killer; *Fixdisk*, a damaged disk salvage utility; *ScreenX*, a screen grabber; *DiskX*, a file editor; *Newzap*, a hexadecimal program editor; *PowerPacker*, a file compressor; Flashdisk, a utility to speed up disk access; *DCopy*, a disk duplicator; and Icon-master, an icon editor. While these are all reasonable utilities in their own right, I have to say that I found the collection a little uninspired. OK, *ScreenX* will let you grab images from some programs which aren't otherwise happy about screengrabs – even some none-multitasking games – but is it really necessary on a disk of utilities? I can't believe that many people who will buy this disk will have much use for a screengrabber.

Anyone 'advanced' enough to want this sort of thing is likely to have their own favourite collection of utilities already. And the same goes for *Newzap*.

To be honest, Workbench replacements like this are getting more and more common, and more and more mediocre. If you want a 'starter kit' of utilities, there are far better offerings out there – and they don't have nauseating colour schemes built in.

Value for money..................4/10

C: COMMANDS AND FONTS

PD Soft disk V586

And here's just such a disk. C: Commands And Fonts is a collection of new and replacement CLI commands which you can place in your C: directory, making them instantly available from the Shell. There are also 21 fonts included.

There are too many commands included on the disk to mention them all, but here are a few:

- DiffDir: reports on differences between two directories

- FFormat: fast disk formatter.

- Most: text and IFF displayer; similar to programs like *MuchMore*, but with support for graphics too.

> **"If you use the CLI, but haven't built up a range of extra commands, you could do worse than get this."**

- split: divides a file, to make it fit on floppy disks.

- xarc: neat little utility which just de-arcs files.

- mkidir: an invaluable CLI command which creates a new directory and a drawer icon at the same time. Takes exactly the same arguments as mkdir, so the latter can be replaced completely if you wish.

- *ScreenX*: the screengrabber mentioned above. However, it doesn't feel so much like it's taking up valuable space on this disk, since it's just one of several utilities, rather than being sold as a major program.

- Setfont: sets system fonts to the font of your choice.

The fonts on the disk include Gatsby, StarTrek, Balloon and C64upper. All in all, a far better valued disk than Mega-Station. If you use the CLI but haven't yet built up a range of extra commands, you could do far worse than get hold of this.

Value for money..................7/10

continued on page 138

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RAM 0510	512K Board - Inc Clock - A500	£29.99	£24.95

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CCA 6011	ROCLITE - 3½" 1Mb - Black Colour	£69.95	£64.95

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WBASE

Anglia PD disk U4015

Simon Dick found that he was in need of a small database that he could access from the Workbench screen, but which didn't take up much memory. So he wrote *WBase*.

WBase, when run, appears as a tiny 'window bar' which sits on the desktop. Clicking on it brings it to the foreground; it doesn't expand, but its menu options are activated. From here you can create a new database, add and delete records, sort information and print it out. To create a new database, you must inform the program how many data fields you will be using and enter a maximum possible number of records.

Since most people are likely to use *WBase* as a permanently available address book, this seems to be a real disadvantage. Incredibly popular people like me (not!) never know how many hundreds of friends we are likely to make over the next few months. Anyway, since there are a maximum of ten (one-line) fields and 150 records in total, I'd better stop meeting new people now.

I'm sure that this program is basically a good idea – I have a similar, but rather better, address book program running on my Mac at work – but it seems to me to be spoiled by pointless restrictions.

WBase's user interface is sparse in the extreme, and my whole confidence in the thing was rather eroded when I read a note in the documentation files which says, rather ominously, "Please don't trust *WBase* with any vital data unless you are sure there aren't any dangerous bugs in it. I am not sure if I have got rid of all the bugs!"

I know that it's impossible to totally debug any program, but why release something and then tell potential users that they would be better off not bothering with it?

Sorry, Simon, but I just can't recommend this one at all.

Program rating....................4/10

WHERE TO GET IT

There are two main ways to get hold of Amiga PD and shareware: from a bulletin board or from a PD library.

The advantage of using a bulletin board is that often the latest software is uploaded as soon as it's available. On the down side, you need a modem to connect, and you'll have to pay phone charges (and sometimes a connection fee to the bulletin board as well).

There are a growing number of bulletin boards with a wide range of Amiga software available for download. Check out 01-for Amiga (071 377 1358) and the Cheam Amiga Bulletin Board (081 644 8714). Another good option is joining CIX (the Compulink Information eXchange), which not only has Amiga software but also contains conference and file areas on a wide range of subjects, from politics to scuba diving, biking to Science Fiction. Many of the *Amiga Shopper* writers have accounts on CIX, so you can get first-hand advice on your problems, too. For more details, call CIX on 081 390 8446 (voice) or 081 390 1255 (modem).

If you don't want to use a bulletin board, the other way to get PD software is from a PD house. Many advertise in *Amiga Shopper*, and you'll find a comprehensive list of names and addresses at the end of this article. Expect to pay between 99p and about £2.50 per disk – there's often a discount if you buy in bulk, too.

UK PD HOUSES

3 Amigos
16 Marsett Way
Leeds LS14 2DN
☎ 0532 733043

Amiganuts United
169 Dale Valley Road
Hollybrook
Southampton SQ1 6QX

AMOS PD Library (also Deja Vu)
25 Park Road
Wigan WN6 7AA
☎ 0942 495261

Anglia PDL
115 Ranelagh
Felixtowe
Suffolk IP11 7HU
☎ 0394 283494

Blitterchips
Cliffe House
Primrose Street
Keighley BD21 4NN
☎ 0535 667469

CLS
PO Box 7
Bletchley
Milton Keynes, MK2 3YL
☎ 0908 640763

Crazy Joe's
145 Effingham Street
Rotherham
South Yorks S65 1BL
☎ 0709 829286

Deltrax PD
36 Bodelwyddan Ave
Old Colwyn
Clwyd LL29 9NP
☎ 0492 515981

Digitz
PO Box 144, Mexborough
South Yorks S64 9SL
☎ 0709 571748

EdLib
Scotland Farm, Stockwood Road
Brislington
Bristol BS4 5LJ
☎ 0272 723489

EMPDL
54 Watnall Road
Hucknall
Nottingham NG15 7LE
☎ 0602 630071

Essex Computer Systems
118 Middle Crockerford
Basildon
Essex SS16 4JA
☎ 0268 553963

George Thompson Services
Cucumber Hall Farm,
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☎ 0707 664 654

Goldstar Computers
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Tyldesley
Manchester M29 7BN
☎ 0942 895320

ICPUG
PO BOX 1309
London N3 2UT
☎ 081-346 0050

Kernow Software PD Library
51 Ennors Road
Newquay, Cornwall

NBS
1 Chain Lane, Newport
Isle Of Wight PO30 5QA
☎ 0983 529594

Neural Images
4 Flint Walk, Hartlepool
Cleveland TS26 0TE
☎ 0492 263508

Office Choice (OC-PD)
30 Town St, Kirkintilloch
Glasgow G66 1NL
☎ 0236 737901

PD Soft
1 Bryant Ave, Southend-On-Sea
Essex SS1 2YD
☎ 0702 612259

Pentire PD
10a Hag Hill Lane, Taplow
Maidenhead, Berks SL6 0JH
☎ 0628 666641

Public Dominator
PO BOX 801, Bishop's Stortford
Herts CM23 3TZ
☎ 0279 757692

Riverdene PDL
30a School Road
Tilehurst, Reading
Berkshire RG3 5AN
☎ 0734 452416

Telescan Computer Services
Handsworth Road
Blackpool FY5 1SB
☎ 0253 22296

Sector 16
160 Hollow Way, Cowley, Oxford
☎ 0865 774472

Seventeen Bit Software
PO BOX 97, Wakefield
West Yorks WF1 1XX
☎ 0924 366982

Software Expressions
Hebron House, Sion Road
Bedminster
Bristol BS3 3BD
☎ 0272 637634

Softville
Unit 5, Stratfield Park
Elettra Avenue,
Waterlooville
Hants
PO7 7XN
☎ 0705 266509

Start Computer Systems
20 Holmside
Sunderland
Tyne and Wear SR1 3JE
☎ 091 565 2506

Startronics
4 Arnold Drive, Droylsden
Manchester M35 6RE
☎ 061 370 9115

Unique Computing
114 Salters Road, Gosforth
Newcastle on Tyne, NE3 3UP
☎ 091-284 7976

Vally PD
PO BOX 15, Peterlee
Co Durham SR8 1NZ
☎ 091-587 1195

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The HD8+ hard drive offers up to 8Mb of standard internal Fast RAM expansion and the A530 Combo, up to 8Mb of 32-bit wide fast RAM expansion. Both feature a SCSI controller, which supports up to 6 additional devices, and an Autoboot/Game cut-off switch. Both are available in 52, 120 and 240Mb hard drive versions.

In addition, the A530 Combo zooms the Amiga forward with an 030 accelerator, running at a blistering 40MHz. This enables your Amiga 500 to run at an incredible 12.1 MIPS, faster than an Amiga 3000! No other product in the world combines all the features found in the A530 Combo! A plug-in PC emulator option, shown below, is available for the HD8+ and A530 Combo.

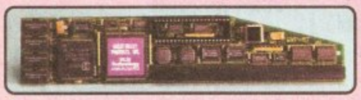


A530

	HD8+	A530
HARD DRIVE		
SCSI HARD DRIVE 52, 120 & 240Mb VERSIONS	●	●
ULTRA FAST 15ms ACCESS	●	●
TRANSFER RATE UP TO 2,100K/sec* (*THE RATE OF THE 240Mb HD)	●	●
ACCELERATOR		
40MHz 68030EC CPU		●
OPTIONAL 68882 MATHS CO-PROCESSOR		●
RUNS AT 12.1 MIPS (FASTER THAN AN A3000!)		●
HARDWARE SUPPORT TO MAP KICKSTART INTO 32-bit WIDE FAST RAM FOR FASTER OPERATION (LIKE CACHING THE OPERATING SYSTEM)		●
RAM BOARD		
UP TO 8MB OF 8 OR 9-bit FAST RAM (8 OR 9-bit WIDE SIMMS - 120ns OR QUICKER)	●	
UP TO 8Mb OF 32-bit WIDE FAST RAM (32-bit WIDE SIMMs - 60ns)		●
1Mb POPULATED		●
OTHER FEATURES		
HDD/ACCELERATOR 'CUT-OFF' SWITCH FOR 100% GAME COMPATIBILITY	●	●
SCSI CONTROLLER FOR UP TO 6 ADDITIONAL DEVICES	●	●
VLSI CUSTOM CHIP	●	●
FAAAST ROM SCSI DRIVER	●	●
IDENTICAL COLOUR & STYLING TO THE A500	●	●
BUILT-IN VENTILATION FAN TO PREVENT THE UNIT FROM OVERHEATING	●	●
DEDICATED POWER SUPPLY	●	●
'MINI-SLOT' FOR FUTURE EXPANSIONS (E.G. PC EMULATOR)	●	●
REMOVABLE MEDIA SUPPORT	●	●
DIRECT MEMORY ACCESS (DMA) STYLE FOR ULTIMATE PERFORMANCE	●	●
EASY-TO-USE SOFTWARE	●	●
2 YEAR WARRANTY	●	●


HD8+

PC EMULATOR
PLUG-IN OPTION FOR HD8+ & A530



- 16MHz 80286 processor
- 287 Maths Co-Processor socket
- 512K of PC RAM plus the use of Amiga RAM
- Supports Hercules, CGA, EGA/VGA (monochrome) and T3100 video modes
- Runs MS-DOS (3.2 and upwards) plus thousands of other PC programs

This powerful 286 emulator module simply plugs into the "mini-slot" of the GVP HD8+ or A530 (without invalidating the warranty). It has full access to the Amiga's resources and allows you to run PC and Amiga programs at the same time, giving you two computers in one.

£199 Ref: EMU 0500

WHAT THE PRESS SAY:

'Superb build, excellent aesthetics and blinding speed make this the best A500 hard drive' ... AMIGA SHOPPER (HD8+)

'GVP claims this is the fastest hard drive in the world and none of our tests could prove that wrong ... Untouchable. THE choice' AMIGA SHOPPER (HD8+)

'Still the best hard drive' ... 92% AMIGA FORMAT 11/91 (HD8+)

'GVP have done it again!' ... 94% AMIGA FORMAT 9/92 (A530)

'... the build quality is excellent ... in terms of performance, their gear is the best ... their equipment is worth every penny'. AMIGA FORMAT 9/92 (A530)

PLUG IN HARD DRIVES & ACCELERATORS

PRICES FROM:

£349

MODEL	52Mb HD	120Mb HD	240Mb HD
HARD DRIVE HD8+	£349 Ref: HAR 0852	£449 Ref: HAR 0920	£729 Ref: HAR 0942
A530 COMBO HARD DRIVE & ACCELERATOR	£699 Ref: HAR 0962	£799 Ref: HAR 0974	£1079 Ref: HAR 0986

FOR ALL AMIGAS



SOUND SAMPLER

- *8-bit stereo sampler*
- *Plugs into parallel port*
- *MIDI support for song input*
- *Extensive editing features*

For the semi-professional and audio hobbyist a high quality 8-bit stereo sound sampler that connects into the parallel port on any Amiga 500, 600, 1500, 2000 or 3000 computer. Combined with one of the fastest, most powerful and easy-to-use sound and music editing programs available. Includes 4-track soundtracker file compatible sequencer.

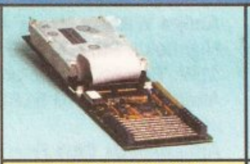
MUS 2500 **£49.95**

AMIGA 1500 + 2000 + 3000 PRODUCTS

ACCELERATORS

	030 25MHz	030 40MHz	030 50MHz	NEW! 040 33MHz
Processor	68030EC	68030EC	68030	68040
Speed MIPS	7.48	12.1	15	30
Speed MHz	25	40	50	33
Math co-proc	68882	68882	68882	Built-in
Standard 32-bit RAM	1Mb	4Mb	4Mb	4Mb
Maximum 32-bit RAM	13Mb	16Mb	16Mb	16Mb
Extras	SCSI	SCSI	SCSI	SCSI Ser/Par
Code	UPG 0110	UPG 0430	UPG 0533	UPG 0740
PRICE	£599	£849	£1199	£1699

All GVP G-Force accelerators can be turned into a hard card by adding a Mount Kit, GVA 4251, £39.95, making it the ULTIMATE Amiga 1500/2000 peripheral. Any 1" SCSI drive can then be mounted on to the accelerator.



HARD CARDS

- *Factory installed Hard Drives*
- *0, 52, 120, 240 & 420Mb options*
- *On-board 8Mb memory sockets*
- *Add up to 6 SCSI devices*
- *Easy to install SIMMS*

The Impact II HC8 hard cards are the equivalent of the HD8+ hard drive, but for the 1500 and 2000 models. Not only are they some of the fastest hard drives available, but they also incorporate an unpopulated 8Mb RAM expansion board.

52Mb	Ref: HAR 1352	£299
120Mb	Ref: HAR 1420/1422	£429
240Mb	Ref: HAR 1540	£699
420Mb	Ref: HAR 1542	£1099

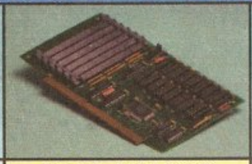


VIDEO ENHANCER

- *16 million colours @ 768 x 580 PAL Res*
- *Supports comp video, S-VHS & RGB*
- *Broadcast quality genlock*
- *Now with RGB splitter*

Impact Vision 24 is the latest 24-bit Professional Video Adaptor. It features 16 million colours on screen at once, built-in genlock, flicker fixer, frame buffer, frame grabber and digital keyer. Supplied with Caligari-IV24 3D modelling and rendering software, Scala IV24 video titling software, plus Macro Paint 24-bit paint package. A1500/2000 requires additional adaptor, GVA 5224, £49.95

IV-24 - VIU SPLITTER	Ref: VID 7024	£1499
IV-24 - VIU TRANSCODER	Ref: VID 7124	£1899



RAM BOARDS

- *Up to 8Mb of FAST RAM*
- *Upgrade in 2Mb increments*
- *Supports industry standard RAM chips*
- *Diagnostic software included*
- *Fully auto-configuring*

The RAM-8 offers an easy way to upgrade your 1500 or 2000 in 2Mb increments up to 8Mb. The RAM 8 is fully auto-configuring and is supplied with peace-of-mind diagnostic software. 6Mb configuration supported for bridgeboard owners

0Mb populated	RAM 2800	£99
2Mb populated	RAM 2802	£149



REMOVABLE MEDIA

- *Syquest 44 or 88Mb removable media*
- *Available with or without HC8 Controller*
- *20ms access time*
- *GVP HC8 Controller option extra*
- *External case available for A500/3000*

Each drive comes with a removable cartridge.

External Case	Ref: GVA 5019	£179
44Mb (Bare Drive)	Ref: HAR 1554	£399
44Mb (+HC8)	Ref: HAR 1568	£479
88Mb (Bare Drive)	Ref: HAR 1678	£499
88Mb (+HC8)	Ref: HAR 1691	£579

ALL PRICES INCLUDE VAT - DELIVERY IS FREE OF CHARGE IN THE UK MAINLAND

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- *FREE OVERNIGHT DELIVERY:* On all hardware orders shipped in the UK mainland.
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Before you decide when to buy your new Amiga products, we suggest you think very carefully about WHERE you buy them. Consider what it will be like a few months after you have made your purchase, when you may require additional peripherals and software, or help and advice. And, will the company you buy from contact you with details of new products? At Silica Systems, we ensure that you will have nothing to worry about. We have been established for almost 14 years and, with our unrivalled experience and expertise, we can now claim to meet our customers' requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now for our latest FREE literature and begin to experience the "Silica Systems Service".

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Opening Hours: Mon-Sat 9.30am-6.00pm No Late Night Opening Fax No: 071-323 4737

LONDON SHOP: Selfridges (1st Floor), Oxford Street, London, W1A 1AB **Tel: 071-629 1234**
Opening Hours: Mon-Sat 9.30am-6.00pm Late Night: Thursday until 8pm Extension: 3914

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Opening Hours: Mon-Sat 9.00am-5.30pm Late Night: Friday until 7pm Fax No: 081-309 0017

To: Silica Systems, AMSHP-1092-68, 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX

PLEASE SEND A BROCHURE ON THE GVP RANGE

Mr/Mrs/Miss/Ms: .... Initials: .... Surname: ....

Company Name (if applicable): ....

Address: ....

....

.... Postcode: ....

Tel (Home): .... Tel (Work): ....

Which computer(s), if any, do you own? 68E

E&OE - Advertised prices and specifications may change - Please return the coupon for the latest information.

Find your local group

1520 Plotter Group (ICPUG) ☎ John Bentley 06286 65932

16-32 Micro Programming AMOS, bimonthly fanzine, PD, (Fish->590) Membership 100FF/ £10 Contact F Moreau, 132 rue Jean Follain, 50000 Saint-Lo, France ☎ 31 52 20 02

Amiga Addicts Newsletter and open nights For info SAE to A Minnock, Clonkelly, Binn, Co Offaly, Ireland.

Amiga Artists Club 34 Roundhay Mount, Leeds LS8 4DW. For Amiga artists, musicians and coders. Pirates not welcome. Free. ☎ KAM on 0532 493942, 5-8pm

Amiga Beginners' Club 110 Whitehill Park, Limavidy, Co. Londonderry BT49 0QG. Club to help newcomers. Bi-monthly club disk, and a small PD library. Membership £2 for a single disk, or £20 for every issue

Amiga Computer Club PD Library, graphics, video, DTP, monthly mag SAE for details to R McDonald, 3 Islay Court, Irvine KA11 4JQ

Amiga help club Contact John Kewley, Derlwyn, New St, Bethel, Nr C'von, Gwynedd, LL57 1YW. Meetings Mondays 7 – 10pm. Graphics, sound, Workbench, programming, help on any topic. Beginners welcome. Free membership

If your group isn't mentioned, fill in the form at the bottom of the page to let us know about you

Amiga Helpline Contact Gordon Keenan, 21 Skirsa Place, Glasgow G23 5EE. Software/hardware help service, free PD, DTP problems sorted, plus general Amiga chit-chat. Send a stamp for full details. Membership £15/year

Amiga Musicians' Club Membership gets you a disk with 50 IFF samples a month for 12 months. Also sample service. Membership £30. Contact Gavin Wylie, Guthrie Street, Carnoustie, Angus

Amiga Navigation Contact Dave Thomas 4a, Allister St, Neath, W Glamorgan. PD, advice, even small repairs and social evenings. Weds 7 – 9pm. Membership £10/year

Amiga Network International 2 monthly club disk, reviews, advice. For info contact Phil or Steve: 434 Denby Dale Rd East, Wakefield, W Yorks WF4 3AE

Amiga PD Oliver MacDonald at Tunley, Albaston, Gunnislake, Cornwall, PL18 9EL. Small but friendly PD Library, 99p a disk. Distribute your own written PD. Send £1.50 for catalogue disk

GET YOURSELF LISTED

If you run a user group which isn't listed on this page, fill in the form below for your free entry. Send it to *Amiga Shopper* User Groups List, 30 Monmouth Street, Bath BA1 2BW. We reserve the right to refuse entries.

AS18

Group name ....

Contact name ....

Contact telephone number ....

Contact address ....

....

....

Place of meetings ....

Time of meetings ....

Type of activities ....

....

Membership fee ....

Amiga PD Exchange at 27 Spa Rd, Preston, Lancashire, PR1 8SL. Chance to exchange PD, shareware, Fish and Tbag disks. £1 for disk and membership

Amiga Users' Klub, Windsor House, 19 Castle St, Bodmin, Cornwall PL31 2DX. Meets every Friday from 6.30-9pm, to expand members' knowledge of Amiga and to help solve people's problems. Contact Jack Talling

Amiga User Group – FYLDE Contact Andy Wilkinson ☎ 0253 724607 25 Glen Eldon Rd, Lytham St Annes, Lancashire FY8 2AX. Meetings twice a month, newsdisk, tuition, technical support, Amiga advice Membership £15/year

Amiga Users club Contact Edward Metcalfe ☎ 021 7441430 49 Burman Rd, Shirley, Solihull, W Midlands B90 2BG PD swapping, games swapping (not copying), competitions, free membership

Amiga Video Producers' Group Meets quarterly in Swindon. For info SAE to J Strutton, 8 Rochford Cl, Grange Park, Swindon, Wilts SN5 6AB ☎ 0793 870667

Amiga Witham Users' Group 85 Highfields Rd, Witham, Essex CM8 1LW. Tips and Basic programs. K Anderson ☎ 0376 518271

Amigaholics Club Free membership. Own disk magazine. For further information contact Kevin Bryan ☎ 071-580 2000 Ext 240 or write to 29 Wolfe Cres, Charlton, London SE7 8TS

Amigamania Bi-monthly newsletter (tips, advice etc), quality PD, discount hardware, software and accessories, free advice. Discount card for High St shops. Annual membership fee £10. Contact S Green, 9 St Lukes Walk, Hawkinge, Kent CT18 7EF

Amos Programmer Club Free membership, swap AMOS programs and PD, disk magazine and help for new users. Contact Gareth Downes-Powell, 6 Brassey Avenue, Broadstairs, Kent CT10 2DS

AMOS Programmers' Exchange Free membership. Swapping software and ideas. Help available. J Lanng, 7 Majestic Rd, Hatch Warren, Basingstoke, Hants RG22 4XD

Amos Programmers Group John Mullen at 62 Lonssdale St, Workington, Cumbria CA14 2YD. Programming hints, tips, tutorials plus several others. SAE for info. £10 membership for bi-monthly disk mag

Avon Micro Computer Club Graphics and animation, business and the chance to speak to professional users. £3 per annum. Contact Roger: 95 Downend Rd, Horfield, Bristol ☎ 0272 513224

Basic Programmers' Group 68 Queen Elizabeth Dr, Normanton, West Yorks WF6 1JF. Encourages the use of Basic, exchanges ideas and assists beginners to the language. Free newsletter Mark Blackall ☎ 0924 892106

Beaconsfield and district CC Contact Philip Lishman ☎0494 782298 27 Russell Court, Chesham, Bucks. Meetings at St Michaels Hall, St Michaels Green, Beaconsfield 7.45 – 9.45pm. Programming, gaming swapping PD, having fun. Membership £20/pa; £10/6 months

Bloomfield video and computing Contact Mrs Beryl Hughes ☎ 0267 2357522 Nashville, 50 Glynderi, Carmarthen, Dyfed SA31 2EX. Meetings at the Bloomfield Community Centre, 7.30pm alternate Tuesdays. Amiga for beginners, video techniques etc. Membership £5

BR & CJ Computer Club B Robinson at 23 Fairway Rd, Shepshed, Loughborough, Leicestershire, LE12 9DS ☎ 0392 72889 or 03922 841296. Regular disk mag packed with tips, reviews of games and serious software, game cheats database, demos and utils, very large PD library. Membership fee £1.25

Camberley User Group Lectures, competitions, advice, meetings, free membership. For more info contact F Wellbelove ☎ 0252 871 545

Champion PD Club PD at 30p, newsletters, advice, help and more. Membership £10. Contact Steve Pickett, 31 Somerset Close, Catterick, N Yorkshire, DL9 3HE

Chester-le-Street 16-Bit Computer Club Ground floor function suite, The Civic Centre, Newcastle Rd, Chester-le-Street. Club meets Mondays from 7.30-9.30pm. Exchange advice and swap tips. Contact Peter Mears ☎ 091-385 2939

CDTV Users Club Swap views on software and hardware. Contact Julian Lavanini, 113 Fouracres Rd, Newall Green, Manchester M23 8ES

Chic Computer Club Full details with an SAE to STAMP, Chic Computer Club, PO Box 121, Gerrards Cross, Bucks. Contact Steve Winter ☎ 0753 884473

Club Amiga £10 a year for PD and a 24-hr helpline service (091-385 2627). For more info send SAE to Chris Longley, 5 Bowes Lea, Shiney Row, Houghton Le Spring, Tyne and Wear

Club Futura Advice to programmers and beginners. Send SAE for info to G Holland, 16 Hermiston, Monkseaton, Whitley Bay, Tyne & Wear NE25 9AN

Comp-U-Pal Australian group for users in the outback. Newsletter, helpline, PD library. Membership A$24. Comp-U-Pal, c/o MDA, PO Box 29, Knoxfield 3180, Victoria, Australia

Computeque Steve Lalley at Inskip Meeting Hall, Ashurst, Skelmersdale, Lancs on 0695 31378 7.45pm – 10.30 pm every Tuesday. From beginner to advanced user. Half year membership £2.50 children, £3 adults

Computer Club 16 Laton Rd, Hastings, East Sussex ☎ 0424 421480. A 16-bit club dedicated to being computer enthusiasts Membership costs £15 per year

Deluxe Cheats Disk User Group Steven Frew at 96 Campden Green, Solihull, West Midlands, B92 8HG. Software advice. Updates every 2 months! £4 for disk £2 for updates

Edinburgh Amiga Group Membership £5, includes free advice and PD. Contact Neil McRea, 37 Kingsknowe Road North, Edinburgh EH14 2DE with SAE

Enfield Amiga club Contact Sean Clifton ☎ 081 8042867 32a Hoe Lane, Enfield, Middx Meet, swap, competitions, helping new users with problems

Exeter 16 Bit User Group Andrew Deeley or Phil Treby at 25A Gloucestershire Rd, Exwick, Exeter, EX4 2EF. Meeting every Wednesday 7pm. Programming £6 per annum

GFA Basic Forum Contact J Findlay ☎ 0788 891197 or send SAE to 52 Church Rd, Braunston, Nr Daventry Northants NN11 7HQ. Beginners and advanced users welcome. Tutorial disk available at £15. Membership free

Guru Masters PD, demos etc, contact the Sheriff, 111 Sherbourne Rd, Banbury, Wolverhampton, WV10 9EU ☎ 0902 782277

Hampshire PD Club Mike Gallienne at 79, Carless Cl, Rownes, Gosport, Hants, PO13 9PW on 0705 585323. Public Domain Disks at 35p. Competitions once a month. Send an SAE for more info to the above address. £10 a year

Hereford Amiga Group Membership free, help, exchange of PD and shareware. Lotus Turbo 2 Quad Player Championship. Contact John Macdonald, Alma Cottage, Allensmore, Hereford HR2 9AT ☎ 0981 21414

In Touch Amiga Penpals, contacts, PD, swaps £2.50/year. For more information contact P Allen, 0342 835530, PO Box 21, Lingfield, Surrey RH7 6YJ

Independent Commodore Products Users' Group Biggin Hill Library, Church Rd, Biggin Hill, Kent. Meets most Thursdays from 7.45-9.45pm. Lectures and open nights. ☎ John Bickerstaff after 8.30pm 081-651 5436. Also national network of user groups. Contact individual groups for details on activities, cost, meetings etc:
Andover ☎ R Geere 0264 790003
Anglesey ☎ N Massey 0407 765221
Coventry ☎ W Light 0203 413511
Dublin ☎ G Reeves 010 353 12 883863
Leeds ☎ R Eyre 0532 487691
Macclesfield ☎ P Richardson 0298 23644
Merseyside ☎ G Titherington 051 521 2553
Mid Thames ☎ M Hatt 0753 645728
S Wales ICPUG ☎ I Kelly 0222 513815
Solent ☎ A Dimmer 0705 254969
SouthWest ☎ P Miles 0297 60339
Stevenage ☎ B Grainger 0438 727925
Watford ☎ M Pryor 0442 864 234
W Riding ☎ K Morton 0532 537318
Wigan ☎ B Caswell 0942 213402

Kent Youth Computer Group Contact Jim Fanning ☎ 0233 629804 North Youth Centre, Essella Rd, Ashford, Kent. Meetings at the North Youth Centre, Thursdays 7 – 10pm computer fair visits, video and DTP work, monthly newsletter Membership 40p/month

Lothian Amiga Users Group Contact Andrew Mackie ☎ 0506 630509 52 Birniehill Ave, Bathgate, W Lothian EH48 2RR Advice and help in buying hardware, software etc, group buying, dealers' circulars welcome. Membership free

Maritime Amiga Club Maritime computing, interact with seafarers ashore on Amigas. Contact CDR K Osei, GN Ships Refit Office, 51 Rue de la Bretonniere, 50105 Cherbourg, France. ☎ 33 33225447

Marksman (Trojan Phazer user group) Contact David Green, 67 Thicket Drive, Maltby, Rotherham, S Yorkshire S66 7LB Promotes use of the Trojan Phazer, swaps PD and own programs, aims to set up a disk magazine

N Ireland Amiga User Contact Stephen Hamer, 98 Crebilly Rd, Ballymena, Co Antrim BT42 4DS. Disk based mag £2.50/issue. Free PD, SAE for further info

Norwich Masked Heros SAE for info. Free membership. Contact Zorro, 278 Aylsham Rd, Norwich, Norfolk NR32RG ☎ 0603 409899

Pennine Amiga Club 26 Spencer Street, Keighley, West Yorkshire BD21 2BU. Free membership, free advice and a newsletter. Contact Neville Armstrong for more info ☎ 0535 609263

Perth and district amateur computer society Contact Alastair MacPherson 137 Glasgow Rd, Perth. Meetings third Tuesday in every month, 8pm. General advice, talks, Amiga PD. Membership £6 or free for under 16s

Public Domain Exchange Demos, music, utilities, animation. Annual fee £8 Contact D McLeish, 26 Taunton Ave, Leigh, Lancs WN7 5PT

Public Domain User Group Swaps PD, provides advice. SAE to 12 Oxford Rd, Guildford, Surrey

PUG Contact S Jackson ☎ 0446 772331 Whitebeam Cottage, Trerhyngyll, Cowbridge, S Glamorgan Cheap PD library, swap hints, reviews, articles etc. SAE for more details

Redburn Computer User Group Contact Paul Armstrong ☎ 0294 56003, 12 Highfield St, Kilwinning, Ayrshire KA13 7BN. Meetings at the Redburn Community Centre, Dickson Drive, Irvine. Meeting every second Wednesday from 5 Aug 92, 6.45 – 9.30pm. Help, ideas, PD and shareware, graphics and business. Membership 75p per meeting; £7/year

Rye Computer Club Swap/meet at the Rye Community Centre. For info contact Oliver Campion, 71 The Mint, Rye, E Sussex TN31 7DP ☎ 0797 222876

Serious Amiga Users Membership £5, £1 admission. Contact J Kucak for more: ☎ 0706 290387. Fortnightly meetings 7.30-11 at the High Crompton Conservative Club

Shieldsoft PD at Wilmar Lodge, 13 Churton Rd, Rhyl, CLwyd.LL18 3NB. Write for more info. Basic programming help. CLI: Amos help. Disks from 50p to 80p. Membership free

Sherlock PD Quarterly disk mag, help and advice for beginners. 50p/disk. A Doyle, 44 Milton Street, Warrenpoint, Co Down, N Ireland

Shropshire Amiga Link Advice, monthly disk mag, PD £15/year fee. Contact N Cockayne, 2 Dodmoor Grange, Randlay, Telford, Shropshire TF3 2AW ☎ 0952 591376

Slim Agnus 115 Brocks Drive, North Cheam, Sutton, Surrey SM3 9UW. Meet last Thursday of month. PD library, BBS, advice from Amiga experts. Contact Philip Worrel.

Software Exchange Service 13 Bournville Lane, Stirchley, Birmingham, West Midlands B30 2JY. For more info ☎ Michael Pun 021-459 7576

South 16 Bimonthly mag and disk, also PD library. SAE for more info. £10/year. Contact Bruce, PO Box 16, Southampton SO9 7AU

South Wales Club Newsletter, PD library, free newsletter, programs, help and advice. For more info contact D Allen 53 West Avenue, Trecenydd, Caerphilly, CF8 2SF

Unique Styles Derek at 15 Montgomery Rd, Highbrooms, Tunbridge Wells, Kent on 0892 518319. By post only. For Amiga artists, programmers/musicians. Free membership

Wardray Hern Consortium User group of user groups for Amiga and possibly others. Membership fees to be discussed and incurred. PD library to be set up. Also Hern connection – worldwide contacts wanted. SAE and disk to WardCon info, (AS) Warren Hardy, 21 Stockfield Ave, Fenham, Newcastle upon Tyne NE5 2DX

Warpdrive (friends of Amiga) Amiga help-line, PD library, bi-monthly disk mag, free drinks, competitions and infosheet. £15 a year. Contact B Scales 110 Burton Ave, Balby, Doncaster DN4 8BB ☎ 0302 859715

WCSPSA! Help available. PD disk of your choice and newsletter every month. PD at £1. Membership fee £25. For more information contact A Jamieson ☎ 0749 677609

Wrexham District Computer Club PD, library, equipment loan. 10p to join, 50p to get in. Memorial Hall, Wrexham every Thursday, 7-10pm. Contact Paul Evans, 3 Ffordd Elfed, Rhosnesi, Wrexham, Clwyd LL12 7LU

Your Amiga Club Helplines, PD, social evenings, classes, club mag. Fee: £12, family £15. Contact P HIggins ☎ 0424 892269. The Old Chapel, Church Rd, Catsfield Battle, Sussex TN33 9DP

PRODUCTS

PRODUCT LOCATOR

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Welcome to the *Amiga Shopper* Buyer's Guide, your regular guide to what's hot and what's not in the Amiga market place. It's designed as a simple-to-use yet comprehensive guide which will help you to make the right buying decisions. The Buyer's Guide will run each and every month and as new products are released and others discontinued, we'll be updating it accordingly. This month we bring you what is possibly the most comprehensive guide to software for the Amiga owner which is all available in the public domain. It may not include each and every PD product ever produced for the Amiga (that would take up virtually the whole of *Amiga Shopper*!), but rest assured that all the major titles are here.

BUSINESS SOFTWARE

Program	Library	Disk	Type	Issue	Rating
TextPlus 3.0	PDSoft	V261	Word processor	1	****
TextEngine 3.0	**Digitz**	**277**	**Word processor**	**13**	***
WordWright	PDSoft	V28	Word processor	13	****
AZSpell	**Digitz**	**Utl277**	**Spell checker**	**13**	****
PowerSnap	Fred Fish	542	Grab screen text as ASCII file	8	*****
UEdit	**AmigaNuts**	**1162**	**Text editor**	**8**	****
AmigaFox	Office Choice	U173	Combine text with graphics	8	**
AmiBase Pro 3	**AmigaNuts**	**–**	**Powerful database**	**9**	****
Liner	Fred Fish	285	Ideas processor like Flow	10	****
NewPRT	**Digitz**	**149**	**Printer drivers for PageStream**	**10**	****
PageStreamFonts	Digitz	149	Fonts for PageStream	10	*****
EasyBanker	**GTS**	**Home2**	**Home finance program**	**10**	****
HomeHelp	GTS	Home1	Computerised grocery lists	10	****
I-Man	**GTS**	**Home2**	**Inventory list management**	**10**	***
MultiPlot	Fred Fish	467	Data graphing program	7	****
Power Planner	**Deja Vu**	**Licenseware**	**Diary/telephone book**	**15**	***
Power Base	Deja Vu	Licenseware	Database	15	*****
Cruiseword	**PD Majik**	**–**	**Word processor**	**16**	**
AmiCash	PS Soft	V630	Home accounts	16	***
Home Manager	**PD Soft**	**V660**	**Personal organiser**	**16**	*****
Word Power	Deja Vu	Licenseware	Spell checker	17	****

MUSIC UTILITIES

Program	Library	Disk	Type	Issue	Rating
MED 3.11	**AmigaNuts**	**973**	**Sound Tracker**	**1**	*****
Module Processor	AmigaNuts	864	Convert modules to executable	1	***
Rippers Disk	**17Bit**	**1055**	**Rip modules from memory**	**5**	****
Sound Ed	Fred Fish	486	Sample editor	5	****
Module Master	**TBAG**	**58**	**Play modules in various formats**	**9**	****
K1 Editor	Fred Fish	332	Patch editor for Kawaii K1	10	*****
CZED	**Fred Fish**	**223**	**Patch editor for Casio synths**	**10**	*****
IBEM	VirusFree	1485	PC compatibles	3	****

EMULATORS

Program	Library	Disk	Machine	Issue	Rating
A64	AmigaNuts	1030	Commodore 64	3	*****
ST Emulator	**Digitz**	**Utl149**	**Atari ST**	**15**	***
QL Emulator	AmigaNuts	1030	Sinclair QL	3	***
ZX Emulator	**AmigaNuts**	**1030**	**ZX Spectrum**	**3**	****

VARIOUS UTILITIES

Program	Library	Disk	Type	Issue	Rating
A-Gene	AmigaNuts	933	Geneology program	1	****
Command.COM	**17Bit**	**866**	**CLI commands in RAM**	**2**	***
MessySID 2	PDSoft	V490	Access PC disks with ease	13	*****
Elements	**Fred Fish**	**593**	**Periodic table of elements**	**13**	****
Cass 1.1	Fred Fish	579	Make your own cassette covers	13	***
Badger	**Fred Fish**	**543**	**Event scheduler**	**13**	***
School TimeTable	AmigaNuts	1100	Generate school timetables	5	***
Arq	**CIX Download**		**Improved system requesters**	**8**	*****
LC24-200 Fonts	NBS	L503	Fonts for Star printers	8	****
Menu Runner	**AmigaNuts**	**1024**	**Run programs from menu**	**8**	***
ButExchange	Fred Fish	494	Reverse mouse buttons	9	****
DeafLab	**Fred Fish**	**494**	**Sign language utility**	**9**	***
PWKeys	Fred Fish	494	Manipulate windows with hotkeys	9	***
InputLock	**Fred Fish**	**494**	**Turn off mouse and keyboard**	**9**	****
RunMe	AmigaNuts	1186	Run programs from menu	9	*****
Hard Drive Special	**GTS**	**–**	**Collection of hard drive utils**	**9**	*****
ScreenMOD	TBAG	58	Modify screens and windows	9	***
Words 3	**AmigaNuts**	**–**	**Solve anagrams**	**9**	***
ClockTick	TBAG	58	2.0-like clock mouse pointer	9	****
FileSearch	**Fred Fish**	**531**	**Find files on a hard disk**	**11**	***
Format 1.1	Fred Fish	535	Replacement disk formatter	11	*****
PowerPacker Utils	**Fred Fish**	**542**	**Utilities for PowerPacker**	**11**	***
LabelMaker	Fred Fish	548	Create disk labels	11	***
ToolsDeamon	**Fred Fish**	**561**	**Run programs for 2.0 Tools menu**	**11**	****
Filer	Fred Fish	562	SID clone for Workbench 2.0	11	****
AWP	**Fred Fish**	**554**	**Animate WB2.0 clock pointer**	**11**	****
RMBShift	Fred Fish	547	Select multiple icons	11	****
Smart Icon	**Fred Fish**	**316**	**Iconifies windows**	**10**	***
Flash Disk	GTS	Utils2	Disk optimizer	10	****
Snap 1.4	**Fred Fish**	**326**	**Grab screen text into clipboard**	**10**	****
SysInfo	Fred Fish	571	System information program	11	*****

PRODUCT LOCATOR

MKSLens	Fred Fish	574	Magnify area of screen	11	***
Font Manager	Digitz	149	Manage your bitmap fonts	10	****
Recover	Digitz	149	Rescue files from corrupt disks	10	***
Track Display	GTS	Utils1	Shows position of drive heads	10	***
FastDiskII	GTS	Utils1	Disk optimizer	10	***
FileMaster	GTS	Utils1	Binary file editor	10	*****
DiskSpeed	GTS	Utils1	Disk drive benchmark program	10	****
Formatter	GTS	Utils1	Replacement disk formatter	10	***
SetNoClick	GTS	Utils1	Turn off annoying drive click	10	***
DevRen	GTS	Utils1	Rename devices including DF0	10	****
LockDevice	GTS	Utils1	Better AmigaDOS 'Lock' command	10	****
Label Print	Fred Fish	227	Disk label printer	10	***
Banner	TBAG	52	Print huge banners	10	****
Avail Mem	Fred Fish	285	Graphical memory monitor	10	***
DCopy	AmigaNuts	700	Disk copier	10	****
MessyDOS	NBS	U619	Read and write PC disks	6	*****
Master Virus Killer	AmigaNuts	971	Virus killer	1	****
Imploder	Fred Fish	422	File compressor	7	***
ARTM	17Bit	1274	System monitor	7	*****
File and HD management	PD Soft	V573	Hard drive utilities	15	*****
Sid 2	17Bit	–	Directory utility	16	*****
File and HD management 2	PD Soft	V575	More hard drive utilities	16	****
Outline fonts	George Thompson	–	For ProPage and PageStream	16	*****
Electronic baby book	PD Soft	V658	Record your baby's details	16	****
Astro 22	PD Soft	V685	Astrology program	17	****
Touch typing tutor	NBS	CLU03	Teach yourself touch typing	17	****
Magnetic Pages	PD Soft	V688	Create your own disk magazine	17	*****

COMMS UTILITIES

LHA 1.11	Fred Fish	593	Archiving utility	13	****
Phone Line Watcher	TBAG	58	Keep track of phone bill	9	****
Term 1.8A	Fred Fish	534	Terminal Program for WB2.0	11	*****
NComm	17Bit	1275	Terminal Program	7	*****

PROGRAMMING UTILITIES

DICE	Fred Fish	443	C Compiler	3	*****
Copper Master	AmigaNuts	1083	Generate Copper Lists	5	***
BRef	Fred Fish	494	BASIC cross referencing utility	9	****
Power Logo	EdLib	24	Enhanced Logo Interpreter	9	***
MIDI Library	Fred Fish	227	Program MIDI applications	9	*****
PCQ Pascal	AmigaNuts	1113	Pascal compiler	6	****
NorthC	AmigaNuts	1112	C Compiler	6	****
Acc Assembler	AmigaNuts	–	Fast Assembler	6	*****
Remm and Rams	Deja Vu	Licenseware	Map editor and scroller utilities	17	***

GRAPHICS UTILITIES

SpectraPaint	Slipped Disk	19	Paint package	3	****
Deluxe Draw	Slipped Disk	18	Paint package	3	**
AMOS Paint	Deja Vu	83	Paint package	3	***
HAMLab	AmigaNuts	1149	Image processing	3	**
3DFont	17Bit	1007	Text to Sculpt Object	3	***
SkyPaint	TBAG	37	Text-based graphics	3	***
SlideShow Kit	VirusFree	1465	Create your own slideshows	3	****
Mandel Mountains	Softville	751	Creates 3D Mandelbrots	5	****
3D Objects Disk 1	AmigaNuts	–	Collection of Sculpt Objects	8	****
PictSaver	Fred Fish	543	Grab screens in IFF Format	9	*****
LandBuild	AmigaNuts	1190	Fractal landscape generator	9	**
Video Text Displayer	AmigaNuts	1199	Basic text scroller	9	***
Converters	17Bit	1221	Image conversion tools	9	***
Vector Designer	AmigaNuts	–	Vector graphics designer	9	**
Plasma	Fred Fish	573	Fast fractals program	11	***
BezSurf 2	Fred Fish	315	Create shaded 3D objects	10	***
DrawMap	Fred Fish	315	Generate maps of the world	10	***
Sprite Designer	AmigaNuts	1102	Create animated sprites	6	**
ImageLab	PDSoft	V518	Image processing program	12	****
Desktop video pack 2	Anglia PD	–	Various DTV utilities inc titler	17	***

EDUCATIONAL SOFTWARE

Learn&Play	Riverdene	Mis637	Maths/Reflex/Logic	5	****
Simon	Deja Vu	APD135	Reflex/Memory	5	***
Space Maths	Deja Vu	APD135	Maths	5	****
TouchStones	Deja Vu	LPD18	Logic	5	****
Shapes	Riverdene	GAM907	Maths/Logic	5	****
Quingo	Deja Vu	LPD21	3 'R's	5	***
Treasure Search	Deja Vu	APD2	Maths/Logic	5	***
JigMania	Deja Vu	LPD13	Maths/Logic	5	****
Spell4Fun	AmigaNuts	1146	Spelling	9	****
Maths4Fun	AmigaNuts	1146	Maths	9	****
XTables	AmigaNuts	1146	Maths	9	*****

FOR SUPPLIER INFORMATION ON ALL THE PRODUCTS LISTED ABOVE SEE UK PD HOUSES PAGE 138

BUYING ADVICE FOR SHOPPERS

Whether buying over the phone or at a local store, here's our advice on how to get what you want

BUYING IN PERSON

- Where possible, always test any software and hardware in the shop before taking it home, to make sure that it works properly.
- Make sure you have all the necessary leads, manuals or other accessories you need.
- Don't forget to keep your receipt.

BUYING BY PHONE

- Be as clear as possible when stating what you want to buy. Make sure you confirm all the technical details of what you are buying. Some things to bear in mind are version numbers, memory requirements, other required hardware or software and compatibility with your particular model of Amiga (that is, make sure you know which version of Kickstart you have).
- Check the price you are asked to pay, and make sure that it's the same as the price advertised.
- Check that what you are ordering is actually in stock.
- Check when and how the article will be delivered, and that any extra charges are as stated on the advert.
- Make a note of the date and time when you order the product.

BUYING BY POST

As with buying by phone, you should clearly state exactly what it is you are buying, at what price (refer to the magazine, page and issue number where it's advertised) and give any relevant information about your system set-up where necessary. You should also make sure you keep copies of all correspondence both to and from the company concerned.

MAKING RETURNS

Whichever method you buy by, you are entitled to return a product if it fails to meet any one of the following three criteria:

- The goods must be of 'merchantable quality'.
- The goods must be 'as described'.
- The goods must be fit for the purpose for which they were sold.

If they fail to satisfy any or all of the criteria, then you are then entitled to:

- Return them for a refund.
- Receive compensation for part of the value.
- Get a replacement or free repair.

When returning anything, ensure that you have proof of purchase and that you return the item as soon as possible after receiving it. For this reason it is important that you check the hardware or software as soon as it is delivered to make sure everything you ordered is there and works as it is supposed to.

HOW TO PAY

Paying by credit card is the most sensible way, whether buying in person, by post or on the phone, because you may be able to claim the money from the credit card company even if the firm you ordered from has gone bust or refuses to help sort out your problem.

Otherwise, you should pay by crossed cheque or postal order – never send coins or notes through the mail.

GETTING REPAIRS

Always check the conditions of the guarantee, and servicing and replacement policy, so that you know what level of support to expect. Always fill in and return warranty cards as soon as possible, and make sure that you are aware of all the conditions contained in the guarantee.

BUYING PD

Even though PD software is relatively inexpensive, you should still apply the guidelines set out above, making sure that you confirm all orders as clearly as possible.

Shopping around is still important when buying PD because different houses charge different prices for the same disks. There is no set pricing structure for disks, but bear in mind that PD houses are, in theory, supposed to be non-profit making operations. AS

A CHECK LIST FOR MAIL ORDER BUYING

1 **Make sure you know exactly what you want. Draw up a checklist of the specifications you are looking for and what you want it to be able to do. Check with the suppliers that their product matches your list**

2 **Will the product you have in mind work with your existing set-up, and anything else you are planning to buy?**

3 **Can you see a demonstration? Many products are on display at computer shows around the country.**

4 **Are there any hidden extras? Does it need 1Mb to run, or a hard disk?**

5 **What technical support is provided by the supplier? Does the manufacturer offer after-sales advice? Check before you buy.**

6 **Check the guarantee terms. How long is the free warranty? What does it offer?**

7 **Draw up a list of these details and make them a condition of your order.**

8 **Check the price and delivery details when you order, and make a note of them.**

9 **Note down when you placed the order and who you spoke to.**

10 **When it arrives, check everything carefully. If anything is missing, don't use the product at all – contact the supplier. If it doesn't work, make the obvious checks such as the fuse. If it still doesn't work don't try to fix it – contact the supplier.**

ADVERTISERS INDEX

CITIZEN

DOT MATRIX PRINTERS
INK JET AND NOTEBOOK

ALWAYS A GOOD IDEA

Silica presents some great offers on the award winning range of high quality matrix printers from Citizen. Each Citizen printer is built in the UK to exacting standards, ensuring superb reliability and output. Our confidence in Citizen's quality is such that we are pleased to include a 2 year guarantee with every printer. Plus, if you buy a Citizen dot matrix printer from us, we will give you the Silica Printer Starter Kit (worth £29.38), ***FREE OF CHARGE!***

FREE DELIVERY
Next Day - Anywhere in the UK mainland

FREE STARTER KIT
Worth £29.38 - With every Citizen dot matrix impact printer from Silica.

2 YEAR WARRANTY
Silica offer a 2 year warranty (including the dot matrix printer head) with every Citizen printer.

WINDOWS 3.0
Free Windows 3.0 driver. Included with the Silica Starter Kit.

FREE COLOUR KIT
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Technical support helpline open during office hours.

MADE IN THE UK
Citizen printers are manufactured to high standards.

LOW PRICE 9 PIN PRINTER



144 CPS 80 COLUMN

- *Citizen 120D+ - 9 pin - 80 column*
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- *4K Printer Buffer + 2 Fonts*
- *Parallel or Serial Interface*
- *Graphics Resolution: 240 x 240dpi*
- *Epson and IBM Emulation*
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- *FREE Silica Printer Starter Kit*

£115
+VAT= £135.13 ref: PRI 2120

RRP £199
SILICA STARTER KIT £25
TOTAL VALUE: £224
SAVING: £109
SILICA PRICE: £115

The Citizen 120D printer comes supplied with a parallel interface as standard. If you require a serial interface instead, please state ref: PRI 2125 when placing your order with Silica.

9 PIN PRINTERS



300 CPS 80 COLUMN

- *Citizen Prodot 9 - 9 pin - 80 column*
- *300cps Draft, 60cps NLQ*
- *8K Printer Buffer + 3 Fonts*
- *Parallel Interface*
- *Graphics Resolution: 240 x 240dpi*
- *Epson and IBM Emulation*
- *FREE Colour Kit*
- *FREE Silica Printer Starter Kit*

RRP £189
COLOUR KIT £41
STARTER KIT £25
TOTAL VALUE: £255
SAVING: £76
SILICA PRICE: £179

£179
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192 CPS 80 COLUMN

- *Citizen Swift 9 - 9 pin - 80 column*
- *192cps Draft, 48cps NLQ*
- *8K Printer Buffer + 3 Fonts*
- *Parallel Interface*
- *Graphics Resolution: 240 x 240dpi*
- *Epson and IBM Emulation*
- *FREE Colour Kit*
- *FREE Silica Printer Starter Kit*

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COLOUR KIT £38
STARTER KIT £25
TOTAL VALUE: £302
SAVING: £113
SILICA PRICE: £189

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+VAT= £222.08 ref: PRI 2209



192 CPS 136 COLUMN

- *Citizen Swift 9x - 9 pin - 136 column*
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- *Colour Option Available*
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24 PIN PRINTER



NEW! SWIFT 2 SERIES

SWIFT 240M
MONO PRINTER
(COLOUR OPTION AVAILABLE)

SWIFT 240C
COLOUR PRINTER

300 CPS 80 COLUMN

- *Citizen Swift 240/240C - 24 pin - 80 column*
- *300cps SD (15cpi), 240 cps Draft, 80cps LQ*
- *8K Printer Buffer - 40K maximum*
- *9 LQ Fonts + 2 Scalable Fonts (8-40pts)*
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STARTER KIT .. £25
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24 PIN PRINTERS

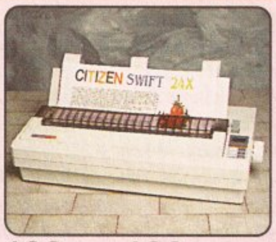


192 CPS 80 COLUMN

- *Citizen 224 - 24 pin - 80 column*
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TOTAL VALUE: £332
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SILICA PRICE: £199

£199
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192 CPS 136 COLUMN

- *Citizen Swift 24x - 24 pin - 136 column*
- *192cps Draft, 64cps NLQ*
- *8K Printer Buffer + 4 Fonts*
- *Parallel Interface*
- *Graphics Resolution: 360 x 360dpi*
- *Epson, IBM and NEC P6 Emulation*
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SILICA PRICE: £349

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360 CPS 80 COLUMN

- *Citizen Projet - inkjet - 80 column*
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SAVING: £137
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£359
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NOTEBOOK PRINTER



64 CPS 80 COLUMN

- *Citizen PN48 Notebook Printer*
- *Non-impact Printing on Plain Paper*
- *53cps LQ - 4K Buffer + 2 Fonts*
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- *Parallel Interface*
- *Graphics Resolution: 360 x 360dpi*
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RRP £325
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SAVING: £106
SILICA PRICE: £219

£219
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FREE! STARTER KIT
WORTH £29.38



This starter kit will help you to get you up and running with your new Citizen dot matrix printer from Silica Systems.

- 3½" Disk - Amiga & ST Drivers
- 3½" Disk - Driver for Windows 3
- 2 Metre Parallel Printer Cable
- 200 Sheets of Continuous Paper
- 100 Continuous Address Labels
- 5 Continuous Envelope

If you already own a printer, and would like to buy a kit, you may order one (ref: KIT 5001) for £19.38 - £10 off RRP!

AMIGA PRINT MANAGER
WORTH £14.10

The Amiga Print Manager dramatically enhances printed output. Provides drivers for all Citizen printers and replaces Amiga's normal printer preference system - printing is quicker, colours more vibrant, graphics less fuzzy. Easy to use with instructions.

Features include:

- Improved Image Smoothing
- Gamma/Colour Correction
- Image Scaling
- Colour Separation
- Reduces/Illiminates Banding

The Amiga Print Manager is available free on request from Silica Systems with the Swift 9, 224 and 240 printers, or may be purchased (ref: ASC 4572) for £13.10 (RRP £14.10).

ACCESSORIES

SHEET FEEDERS
PRA 1200 1200 .... £71.38
PRA 1215 124D/224/Swift 9/24 .. £88.70
PRA 1228 124D/224/Swift 9/24 .. £42.00

SERIAL INTERFACES
PRA 1189 120D+ £56.45
PRA 1209 Swift 9/9x/124D/224 .. £32.25
PRA 1709 Swift 24/24x/24e £26.38

32K MEMORY EXPN
PRA 1753 124D/224/Swift 24 ..... £13.10

PRINTER STAND
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PRA 1274 Swift 9X/24X £30.66

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RIB 3924 124D/Swift 24 Black £4.70
RIB 3936 224/Swift 9/24 Colour .. £15.63
RIB 3248 PN48 Single Strike £3.61
RIB 3348 PN48 Multi Strike £3.61

COLOUR KITS
PRA 1236 224/Swift 9/24/24e/240 £35.25
PRA 1240 Swift 9x/24x £35.25

PN48 ACCESSORIES
PRA 1148 PN48 Battery £46.70
PRA 1155 PN48 Cable Extn £29.37
PRA 1162 PN48 Car Adaptor £16.80

Accessories prices inc. VAT & delivery

SILICA SYSTEMS OFFER YOU

- ***FREE OVERNIGHT DELIVERY:*** On all hardware orders shipped in the UK mainland.
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Before you decide when to buy your new printer, we suggest you think very carefully about WHERE you buy it. Consider what it will be like a few months after you have made your purchase, when you may require additional peripherals and accessories, or help and advice with your new purchase. And, will the company you buy from contact you with details of new products? At Silica Systems, we ensure that you will have nothing to worry about. We have been established for almost 14 years and, with our unrivalled experience and expertise, we can now claim to meet our customers' requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now for our latest FREE literature and begin to experience the "Silica Systems Service".

MAIL ORDER HOTLINE 081-309 1111

SILICA SYSTEMS

MAIL ORDER: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX **Tel: 081-309 1111**
Order Lines Open: Mon-Sat 9.00am-6.00pm No Late Night Opening Fax No: 081-308 0608

LONDON SHOP: 52 Tottenham Court Road, London, W1P 0BA **Tel: 071-580 4000**
Opening Hours: Mon-Sat 9.30am-6.00pm No Late Night Opening Fax No: 071-323 4737

LONDON SHOP: Selfridges (1st Floor), Oxford Street, London, W1A 1AB **Tel: 071-629 1234**
Opening Hours: Mon-Sat 9.30am-6.00pm Late Night: Thursday until 8pm Extension: 3914

SIDCUP SHOP: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX **Tel: 081-302 8811**
Opening Hours: Mon-Sat 9.00am-5.30pm Late Night: Friday until 7pm Fax No: 081-309 0017

To: Silica Systems, AMSHP-1092-55, 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX

PLEASE SEND A BROCHURE ON THE CITIZEN RANGE

Mr/Mrs/Miss/Ms: .... Initials: .... Surname: ....

Company Name (if applicable): ....

Address: ....

....

.... Postcode: ....

Tel (Home): .... Tel (Work): ....

Which computer(s), if any, do you own?.. 55H

E&OE - Advertised prices and specifications may change - Please return the coupon for the latest information.

WIN • WIN • WIN • WIN • WIN • WIN • WIN • WIN

Free – ten copies of Home Accounts 2

Thanks to Digita International, we have £550 worth of prizes to give away in the form of Home Accounts 2*, the excellent financial package*

It is said that a day will come when every man (and woman too, one assumes) will be held accountable for his (or her) actions. For most of us this day invariably seems far off, hence we rarely give it any thought. No, our need to appease a secular arbiter is more pressing than any moral imperative, balanced as our actions are, not on the scales of virtue and sin, but on those of credit and debit. This judge, whose words we await with awe, since they can consign us either to bliss or damnation – this judge is our bank manager.

And so what better way of keeping this omnipotent being happy, of being scrupulously aware of all our earthly transactions, than with a computerised accounting system? Digita International's *Home Accounts 2* fits the bill nicely; with its attractive, easy to use interface, its ability to handle time-based regular transactions such as direct debits, and its handling of VAT, it more than deserves its price tag and the acclaim it has received.

Digita has kindly donated ten of these packages for us to give away, to aid you in keeping body and soul together here on Earth.

Have a go at the three questions below and send your answers on a postcard or the back of a sealed envelope to:

Anodyne Accountancy... Not
Amiga Shopper
29 Monmouth Street
Bath BA1 2DL

The closing date is October 12. Only one entry per household will be permitted. Entries from bank managers will be disqualified. AS

THE CHALLENGE

QUESTION 1

What does HIP, as used in *Home Accounts 2*, stand for?

a) Happy Input Process
b) Highly Intuitive Parsing
c) Human Interface Protocol

QUESTION 2

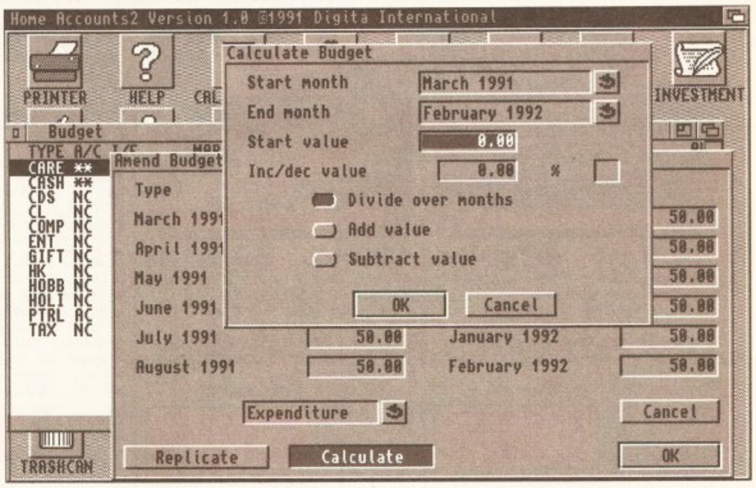
What is the missing word in 'brigands demand your ... or your life, whereas women require both'?

a) Money
b) Sword
c) Sustenance

QUESTION 3

Name the EEC's official currency.

a) Emu
b) Ecu
c) Franc



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The lucky winners of August's competition are: Zoe Beale of Herts, Ben Lamb of Suffolk, Mathew Dodd of Essex, C Spear of South Glamorgan, DJ Goldsmith of Leicester, Pamela Hammour of Stockport, BA Briscombe of Cheshire, Trevor Cobbe of Leicester, Chris Millar of Dumfries, Chris Hendry of Lancashire, D Brown of Tyne & Wear, Mark Ireland of Kent, Peter Bain of South Wales, EA Limby of East Sussex and Steve Harrison of Cheshire. Congratulations – your copies of *Easy Amos* are on their way.

IN NEXT MONTH'S ISSUE

● The future of the Amiga – the country's top Amiga experts debate the current and future state of Amiga technology and offer their opinions as to what Commodore must do next. If you're interested in the future of your machine, you can't afford to miss this special feature

● The definitive Amiga Shopper PC emulator round-up. Do you need one? If so, which is the best?

● With PCs encroaching on one side, and consoles on the other, Toby Simpson, professional games developer, looks at what the Amiga has to offer over the consoles.

Plus regular columns on Amiga Answers, video, AmigaDOS, desktop publishing and much more

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tions as we know at the time of going to press: pact Design, Kickstart/Workbench 2.05, 3.5" Internal 880K sk Drive, Built-in TV Modulator, 20Mb. Hard Disk Drive [2.5" 600-HD model only], 1Mb RAM as standard with an option to ery simply to 2Mb. with RAM expansion in 'trapdoor', 2 Joy- se ports, Full Colour Composite Video output, 'Smart Card' ws games on ROM to be loaded instantly... no more waiting! sible future upgrade port [eg. RAM cards etc], 4096 Colours, und, Standard Parallel and Serial ports for printers etc.

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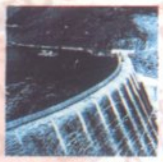
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